ΒΙΟΓΡΑΦΙΚΟ ΣΗΜΕΙΩΜΑ ΚΑΙ ΑΝΑΛΥΤΙΚΟ ΥΠΟΜΝΗΜΑ

ΜΑΡΙΟΣ ΑΝΑΓΝΩΣΤΟΥ
ΔΡ ΥΔΡΟΜΕΤΕΩΡΟΛΟΓΙΑΣ - ΥΔΡΟΛΟΓΙΑΣ ΚΑΙ ΜΕΤΕΩΡΟΛΟΓΙΚΩΝ ΡΑΝΤΑΡ

Δεκέμβριος 2020

ΠΡΟΣΩΠΙΚΕΣ ΠΛΗΡΟΦΟΡΙΕΣ

ΑΛΕΠΟΥ, 49100 ΚΕΡΚΥΡΑ (ΕΛΛΑΔΑ)
+30 26610 52704 +30 69741 13259
sifneos@live.com / managn@noa.gr
www.researchgate.net/profile/Marios_Anagnostou2/?ev=hdr_xprf
Skype Marios Anagnostou

Φύλο: Άρρεν

Εθνικότητα: ΕΛΛΗΝΙΚΗ

ΕΚΠΑΙΔΕΥΣΗ ΚΑΙ ΚΑΤΑΡΤΙΣΗ ΣΕ ΒΙΟΜΗΧΑΝΙΑ

01/07/1997-30/09/1997 ΚΑΙ 01/07/1998-30/09/1998

Ελληνική Αεροπορική Βιομηχανία Α. Ε., Τανάγρα (Ελλάδα)

Maintenance, repair and inspection of avionics systems and relevant aircraft electronics devices of the C-130, F-4E, A-7E, Mirage 2000C and F-16C Block in the Hellenic Aerospace Industry.

"OJT" training in the Navigation/Communication Shop of the Electronics Directorate and in the area of VHF/UHF Comm. and Radar systems in the Hellenic Aerospace Industry. (A2)

ΕΚΠΑΙΔΕΥΣΗ ΚΑΙ ΚΑΤΑΡΤΙΣΗ

01/10/1996–13/06/2000

Βασικές Σπουδές στον τομέα των Μηχανικών και Master of Engineering στα Ηλεκτρονικά Αεροσκαφών (Avionics) (Μεταπτυχιακός Βοηθός Ερευνητής) (A3)

ΠΑΝΕΠΙΣΤΗΜΙΟ ΤΟΥ ΓΙΟΡΚ, ΓΙΟΡΚ (ΑΓΓΛΙΑ)

Τίτλος Μεταπτυχιακής Εργασίας: «*Conceptual design of an air-to-ground and air-to-air Ultrawide band data link system*»

Κύρια Θέματα: Principles of Flight, Control Theory, Flight Control, Aviation Electronics, Radar, Automatic Flight Control Systems, Transducers Sensors and Actuation, Embedded Computer Systems, Mathematic Engineering, Laboratory Practical, Modern & Digital Control, Antennas and Propagation.

Επιλογής: Computing Digital Circuit Design and Programming, Communications Analysis of Frequency and Filters Design & Construction Project, Circuit Design (Analogue and Digital), Electromagnetic Fields and Transmission Lines, Wireless Principles, Major Circuit Components Design and Application Noise and Interference in Circuits, Software Engineering Project, Computer Programming in Java/C, Software Engineering, Semiconductor Devices, Analogue Circuitry, Neural Networks, Distributed Computer Systems, Digital Engineering, Distributed Circuits, Radio Frequency and Microwave Circuit Design, Signal Processing.

Επαγγελματικές δεξιότητες: ειδίκευση στον τομέα των αεροναυτικών ηλεκτρονικών, συνδυάζοντας βασική και θεμελιώδη εκπαίδευση, με την κάλυψη ενός ευρέος φάσματος θεματικών ενοτήτων πάνω στην επιστήμη των ηλεκτρονικών μηχανικών και μηχανικών ηλεκτρονικών υπολογιστών με έμφαση στις αεροδιαστημικές εφαρμογές.

26/08/2000–31/05/2006

Doctor of Philosophy in Civil Engineering (Μεταπτυχιακός Βοηθός Ερευνητής) (A4)

ΠΑΝΕΠΙΣΤΗΜΙΟ ΤΟΥ ΚΟΝΝΕΚΤΙΚΑΤ, ΤΜΗΜΑ ΠΟΛΙΤΙΚΩΝ ΚΑΙ ΠΕΡΙΒΑΛΛΟΝΤΟΛΟΓΩΝ ΜΗΧΑΝΙΚΩΝ, Στορς (ΗΠΑ)

Τίτλος Διδακτορικής Διατριβής: «*Mobile High Resolution X-Band Polarimetric Doppler Weather Radar Measurements (XPOL): Evaluation and Application*»

Κύρια Θέματα: Radar Rainfall Estimation, Probabilistic Methods in Engineering and Physical Sciences, Hydrological Remote Sensing, Sem in Environmental Science and Engineering, Electromagnetic Wave Propagation, Theory and Computer Algorithms, Hydrometeorology, Micrometeorology, Ground Water Flow Modeling, Hydroclimatology.

Επαγγελματικές δεξιότητες: ανάπτυξης αλγορίθμων ποσοτικής εκτίμησης κατακρήμνισης χρησιμοποιώντας συστήματα τηλεπισκόπησης (π.χ., μετεωρολογικά ραντάρ, δορυφόρους, κ.τ.λ.)

ΕΠΙΣΤΗΜΟΝΙΚΉ ΈΡΕΥΝΑ

Ο Δρ. Αναγνώστου αναπτύσσει ένα διεθνώς αναγνωρισμένο ερευνητικό πρόγραμμα που δραστηριοποιείται πάνω σε βασικά θέματα ανάλυσης ατμοσφαιρικών και επιφανειακών υδρομετεωρολογικών διαδικασιών του υδρολογικού κύκλου σε διάφορες χωροχρονικές κλίμακες. Η ερευνά του εστιάζει:

(α) στη δημιουργία βελτιωμένων τεχνικών υπολογισμού υδρομετεωρολογικών/υδρολογικών (π.χ. βροχόπτωση, εδαφική υγρασία, εξάτμιση) και θαλάσσιων (π.χ. θερμοκρασία και αλατότητα της επιφανείας της θάλασσας) μεταβλητών από στοιχεία δορυφορικής (satellite) και επίγειας (radar) τηλεπισκόπησης, και

(β) στη βελτίωση των προγνώσεων ακραίων υδρομετεωρολογικών φαινομένων (όπως καταιγίδες, πλημμύρες, άνεμοι, ανεμοστρόβιλοι, κεραυνοί) από δυναμικά μοντέλα προσομοίωσης δημιουργώντας τεχνικές βέλτιστης αφομοίωσης των στοιχείων τηλεπισκόπησης στα μοντέλα αυτά. Συνολικά το ερευνητικό και συγγραφικό έργο του Δρ. Αναγνώστου (όπως παρουσιάζεται στις Πρόσθετες Πληροφορίες) κατηγοριοποιείται σε τρεις (3) θεματικές ενότητες, που είναι:

- *Ενότητα 1η «Ποσοτική εκτίμηση βροχόπτωσης σε πραγματικό χρόνο από συστήματα τηλεπισκόπησης (μετεωρολογικά ραντάρ επιγεία και δορυφορικά) και εφαρμογές σε προγνωστικά μετεωρολογικά μοντέλα»*
- *Ενότητα 2η «Εφαρμογές επίγειας (μετεωρολογικά ραντάρ) και δορυφορικής τηλεπισκόπησης στη πρόγνωση υδρολογικών παραμέτρων (απορροή, εδαφική υγρασία, υδρολογικός κύκλος)»*
- *Ενότητα 3η «Νέες πειραματικές τεχνολογίες/τεχνικές τηλεπισκόπησης παραμέτρων βροχής (ένταση βροχής σε υψηλή ευκρίνεια, χωροχρονική κατανομή υδρογοσταγόνων, κατηγοριοποίηση βροχής, κτλ.) πάνω από ξηρά και θάλασσα—(1) ραντάρ διπλής πολικότητας & υψηλής συχνότητας (X-band), και (2) υποθαλάσσιοι αισθητήρες παθητικής ακουστικής (underwater passive acoustic systems)»*

© Ευρωπαϊκή Ένωση, 2002-2013 | http://europass.cedefop.europa.eu

ΕΠΑΓΓΕΛΜΑΤΙΚΗ/ΕΡΕΥΝΗΤΙΚΗ ΕΜΠΕΙΡΙΑ ΚΑΙ ΠΡΟΥΠΗΡΕΣΙΑ

01/08/2000–30/06/2001 **Μεταπτυχιακός Βοηθός Ερευνητής (Α11)**

Εθνικό Αστεροσκοπείο Αθηνών, Αθήνα (Ελλάδα)

Ερευνητής Μηχανικός υποστήριξης και συλλογής δεδομένων δοκιμών πεδίου του μετεωρολογικού ραντάρ διπλής πολικότητας του Ε.Α.Α. / Εξωτερικός συνεργάτης

15/12/2006–31/07/2009 **Μεταδιδακτορικός Συνεργάτης Ερευνητής (Α12)**

Κέντρο Περιβαλλοντικών Επιστημών και Μηχανικής, Πανεπιστήμιο του Κοννεκτικατ, Στορρς (ΗΠΑ)

Ανάπτυξη αλγορίθμων ποσοτικής εκτίμησης κατακρήμνισης χρησιμοποιώντας συστήματα τηλεπισκόπησης και συστήματα υποθαλάσσιας ακουστικής / Μεταδιδακτορικός ερευνητής/λέκτορας.

Κύρια Θέματα: Ερευνητικά, Διδασκαλία. Επαγγελματικές δεξιότητες: Διδακτικό έργο:
Πιθανότητες και Στατιστική για Μηχανικούς (Civil Engineering Systems)
Υδρομετεωρολογία (Hydrometeorology)
Τηλεπισκόπιση Υδρολογικών Συστημάτων (Hydrologic Remote Sensing)
Πιθανολογικές Μέθοδοι για Περιβαλλοντολόγους Μηχανικούς (Probabilistic Methods in Environmental Engineering)

01/09/2007–30/04/2010 **Συνεργάτης Ερευνητής (Α13)**

Ελληνικό Κέντρο Θαλασσίων Ερευνών, Ανάβυσσος (Ελλάδα)

Επιστημονικός συνεργάτης στον τομέα της υποθαλάσσιας ακουστικής που χρησιμοποιείται για την κατηγοριοποίηση και ποσοτικοποίηση γεωφυσικών φαινομένων (π.χ., ποσότητα υετού, μέση ένταση ανέμου, κ.τ.λ.), θαλάσσιων θηλαστικών και ανθρώπινων δραστηριοτήτων (π.χ., πλοία, αλιεία, κ.τ.λ..) σε θάλασσες και ωκεανούς, καθώς επίσης και στον τομέα της ανάπτυξης αλγορίθμων ποσοτικής εκτίμησης κατακρήμνισης χρησιμοποιώντας συστήματα τηλεπισκόπησης (π.χ., μετεωρολογικά ραντάρ, δορυφόρους, κ.τ.λ.) με βάση τη Χορηγία Αριστείας (Excellent Award) Marie Curie, που αφορά το ερευνητικό πρόγραμμα «PreWec» (Advancing the predictability of water cycle through an improved understanding of land surface and coastal water processes and optimal integration of models with observational data) του 6ου Προγράμματος-Πλαισίου της Ευρωπαϊκής Ένωσης.

01/10/2010–31/07/2011 **Εξωτερικός Συνεργάτης Ερευνητής (Α14)**

Εθνικό Αστεροσκοπείο Αθηνών, Αθήνα (Ελλάδα)

Υποστήριξη πειράματος – συλλογή δεδομένων ραντάρ στη Μολδαβία και δημιουργία αλγόριθμων για την ποσοτική εκτίμηση της βροχής από δεδομένα ραντάρ διπλής πολικότητας.

01/03/2010–31/03/2012 **Επιστημονικός συνεργάτης (Α15)**

Πανεπιστήμιο Σαπιένζα της Ρώμης, Ρώμη (Ιταλία)

Ανάπτυξη και υποστήριξη ενός νέας γενεάς αλγορίθμου για υψηλής ανάλυσης παρατηρήσεων της μικροφυσικής των διάφορων μορφών της κατακρήμνισης από X-band ραντάρ διπλής πόλωσης, επικεντρωμένες σε ορεινές και αστικές λεκάνες, για την καλύτερη εκτίμηση και πρόβλεψη των πλημμυρών χρηματοδοτούμενο από του 7ου Προγράμματος-Πλαισίου της Ευρωπαϊκής Ένωσης.

28/03/2012–26/07/2014 **Εξωτερικός Επιστημονικός Συνεργάτης (Α16)**

Εθνικό Αστεροσκοπείο Αθηνών, Αθήνα (Ελλάδα)

Επιστημονικός συνεργάτης (συνεργασία επί έργου) με το Ινστιτούτο Ερευνών Περιβάλλοντος και Βιώσιμης Ανάπτυξης (ΙΕΠΒΑ) του Εθνικού Αστεροσκοπείου Αθηνών (ΕΑΑ). Τα ερευνητικά ερωτήματα που θα εξεταστούν σε αυτό το έργο είναι τα ακόλουθα: 1) Ποία είναι η εξάρτηση της ακρίβειας εκτίμησης της βροχόπτωσης με X-band ραντάρ διπλής πόλωσης από την χωρική κλίμακα και την ύπαρξη διάφορων φάσεων του νερού στη διαδρομή της δέσμης του ραντάρ. 2) Ποία είναι η βελτίωση της εκτίμησης της βροχόπτωσης με τη χρήση τοπικής εμβέλειας X-band ραντάρ διπλής πόλωσης σε σχέση με τα συμβατικά επιχειρησιακά C-band ραντάρ μεγάλης εμβέλειας. 3) Ποία είναι η επίδραση την χωρικής ανάλυσης και η πιθανή βελτίωση της ακρίβειας της εκτίμησης της βροχόπτωσης σε προσομοιώσεις πλημμυρών, και πια είναι η εξάρτηση από το μέγεθος της υδρολογικής λεκάνης, της λεκάνης απορροής, των χαρακτηριστικών της καταιγίδας και τη πολυπλοκότητα του υδρολογικού μοντέλου που χρησιμοποιείται στην πρόγνωση της απορροής του νερού της βροχής.

02/02/2015–30/04/2016 **Εξωτερικός Επιστημονικός Συνεργάτης (Α17)**

Εθνικό Μετσόβιο Πολυτεχνείο, Αθήνα (Ελλάδα), Επιστημονικός συνεργάτης (συνεργασία επί έργου) με τον τομέα Υδατικών Πόρων και Περιβάλλοντος της Σχολής των Πολιτικών Μηχανικών, στα πλαίσια του έργου:

1. "**ALPINE – A Low Power Intelligent sensor Network architecture for Environmental Management**". Το αντικείμενο εργασιών στο έργο αυτό είναι η ανάλυση αβεβαιότητας και διακινδύνευσης από υδρομετεωρολογικά δεδομένα που θα παρέχονται από τους αισθητήρες σε πραγματικό χρόνο, και

2. "**PERL – Task 4.3: Advanced uncertainty methods and tools for early warning**" με αντικείμενο εργασιών την διερεύνηση και δημιουργία μεθοδολογίας για την διάδοση της αβεβαιότητας της πρόγνωσης του υετού σε προγνωστικά υδρολογικά μοντέλα και περιγραφή των επιπτώσεων αυτών σε συστήματα έγκαιρης προειδοποίησης.

01/09/2016–31/12/2016
01/03/2017–30/06/2017
01/09/2018 -30/11/2018

3. Ανάλυση και επεξεργασία υδρομετεωρολογικών δεδομένων από μετεωρολογικό ραντάρ και επίγειους σταθμούς στα πλαίσια του προγράμματος με τίτλο: «**έργο επιβράβευσης του Κ.Α. 63/203100 και 63/193600 ως απόφαση ΓΓΕΤ 71644/28.04.16**».

01/08/2018–31/12/2019 **Εξωτερικός Επιστημονικός Συνεργάτης (Α20)**

Εθνικό Αστεροσκοπείο Αθηνών, Αθήνα (Ελλάδα)

«**Συλλογή και ανάλυση δεδομένων με μετεωρολογικό ραντάρ και διάχυση αποτελεσμάτων**», στο πλαίσιο υλοποίησης του ερευνητικού προγράμματος με τίτλο «**Ionian-Adriatic earLy wARning Monitoring System - i-ALARMS**» της δράσης **INTERREG IPA II CROSS-BORDER COOPERATION PROGRAMME GREECE-ALBANIA 2014-2020**.

01/12/2020-28/02/2021 **Εξωτερικός Επιστημονικός Συνεργάτης (A21)**

Ιόνιο Πανεπιστήμιο, Τμήμα Πληροφορικής, Κέρκυρα (Ελλάδα)

«**Ανάλυση υδρολογικών δεδομένων και διαμόρφωση πρωτοκόλλου συλλογής και επεξεργασίας. Πακέτα Εργασίας WP3**», στα πλαίσια του έργου με τίτλο «Βελτίωση της διαχείρισης και της υποδομής διάθεσης υδάτινων πόρων μέσω έξυπνων τεχνολογιών, πολιτικών και εργαλείων SAVE-WATER» που υλοποιείται στο πλαίσιο του INTERREG IPA II CROSS-BORDER COOPERATION PROGRAMME GREECE-ALBANIA 2014-2020

Αξιολογητής (A18)

24/12/2013-31/10/2015 Πολυτεχνείο Κρήτης, Χανιά, Κρήτη: Εξωτερικός αξιολογητής στα πλαίσια του έργου «Ενίσχυση του ανθρώπινου ερευνητικού δυναμικού μέσω της υλοποίησης Διδακτορικής Έρευνας – ΗΡΑΚΛΕΙΤΟΣ ΙΙ, ΠΟΛΥΤΕΧΝΕΙΟΥ ΚΡΗΤΗΣ» (**A18.1**)

02/02/2015-31/10/2015 Πανεπιστήμιο Ιωαννίνων, Ιωάννινα: Αξιολόγηση, δημιουργία ερωτηματολογίων ποιοτική και στατιστική ανάλυση δεδομένων και συμπερασμάτων στα πλαίσια του έργου: «Ενίσχυση του ανθρώπινου ερευνητικού δυναμικού μέσω της υλοποίησης Διδακτορικής Έρευνας – ΗΡΑΚΛΕΙΤΟΣ ΙΙ, ΠΑΝΕΠΙΣΤΗΜΙΟ ΙΩΑΝΝΙΝΩΝ» (**A18.2**)

01/08/2015-30/11/2015 Εξωτερικός αξιολογητής στα πλαίσια του έργου «Ενίσχυση των ερευνητικών ομάδων στο ΤΕΙ Καβάλας – ΑΡΧΙΜΗΔΗΣ ΙΙΙ, ΤΕΙ ΚΑΒΑΛΑΣ» (**A18.3**)

05/08/2015-15/10/2015 Αξιολόγηση, δημιουργία ερωτηματολογίων ποιοτική και στατιστική ανάλυση δεδομένων και συμπερασμάτων στα πλαίσια του έργου: «Δομή Απασχόλησης και Σταδιοδρομίας – ΔΑΣΤΑ Χαροκοπείου Πανεπιστημίου» (**A18.4**)

ΣΤΟ ΙΔΙΩΤΙΚΟ ΤΟΜΕΑ

01/04/2014–30/09/2017 **Επιστημονικός Σύμβουλος (A19)**

- Κέντρο Καινοτόμων Τεχνολογιών, Αθήνα (**A19.1**)

Συμμετοχή στο έργο του 7ου Προγράμματος Πλαίσιο (FP7) με τίτλο «Global Earth Observation for integrated water resource assessment – EartH2Observe» όπου η υποχρεώσεις του συμβούλου είναι να συμμετάσχει στην αξιολόγηση των παγκόσμιων υδάτινων πόρων μέσω της χρήσης νέων συνόλων δεδομένων και τεχνικών παρατήρησης της Γης, και ποιο συγκεκριμένα οι εργασίες θα περιλαμβάνουν τις παρακάτω θεματολογίες:

1) **Δείκτες προσανατολισμένοι στον χρήστη,**
2) **Συντονισμός της αξιολόγησης της υγρασίας του εδάφους με βάση την εκτίμηση του σφάλματος βροχοπτώσεων των δορυφόρων, και**
3) **Συντονισμός του workshop στην Αιθιοπία σε συνεργασία με το AUU.**

01/04/2016-31/12/2018
- WeMET I.K.E, Αθήνα (**A19.2**)

Συμμετοχή στο έργο «**WASSF-II**» με αντικείμενο εργασίας **την επεξεργασία γεωφυσικών παραμέτρων από δεδομένα προγνωστικών μοντέλων και μετρήσεων τηλεπισκόπησης, καθώς επίσης και στην εγκατάσταση, επικαιροποίηση και διαχείριση ενός επιχειρησιακού υδρολογικού μοντέλου πρόγνωσης πλημμυρών για την έκδοση προειδοποιήσεων ακραίων πλημμυρικών επεισοδίων στην περιοχή της Σ. Αραβίας.**

ΑΤΟΜΙΚΕΣ ΔΕΞΙΟΤΗΤΕΣ					
Ξένες Γλώσσες	ΚΑΤΑΝΟΗΣΗ		ΟΜΙΛΙΑ		ΓΡΑΦΗ
	Προφορική	Γραπτή (ανάγνωση)	Επικοινωνία	Προφορική έκφραση	
Αγγλικά	C2	C2	C2	C2	C2
	Master/Ph.D.				
	Επίπεδα: A1/A2: Βασικός χρήστης - B1/B2: Ανεξάρτητος χρήστης - C1/C2: Έμπειρος χρήστης Κοινό Ευρωπαϊκό Πλαίσιο Αναφοράς για Γλώσσες				

Εκπαιδευτική Εμπειρία (αντίγραφα αξιολογήσεων είναι διαθέσιμα αν ζητηθούν) (B)

2006 – 2007: Μεταπτυχιακός βοηθός διδασκαλίας σε μεταπτυχιακούς και προπτυχιακούς φοιτητές του τμήματος Πολιτικών και Περιβαλλοντολόγων Μηχανικού του Πανεπιστήμιου του Κοννέκτικατ ως Μεταπτυχιακός Φοιτητής και Μεταδιδακτορικός Συνεργάτης Ερευνητής:

- Πιθανότητες και Στατιστική για Μηχανικούς (Civil Engineering Systems)
- Υδρομετεωρολογία (Hydrometeorology)
- Τηλεπισκόπιση Υδρολογικών Συστημάτων (Hydrologic Remote Sensing)
- Πιθανολογικές Μέθοδοι για Περιβαλλοντολόγους Μηχανικούς (Probabilistic Methods in Environmental Engineering)

2008 – 2011: Διδασκαλία σε μεταπτυχιακούς και προπτυχιακούς φοιτητές από διάφορα ελληνικά πανεπιστήμια κατά την διάρκεια θερινού σχολείου/workshop που διοργανώθηκε από το Ελληνικό Κέντρο Θαλασσίων Ερευνών στο πλαίσιο του Marie Curie Excellence Team:

- Τηλεπισκόπιση Υδρολογικών Συστημάτων (Hydrologic Remote Sensing)
- Πιθανότητες και Στατιστική για Μηχανικούς (Civil Engineering Systems)

Απρίλιος – Ιούλιος 2015: καθηγητής κατά την διάρκεια εκπαιδευτικού σεμιναρίου κατάρτισης (εφαρμογές σε Υδρομετεωρολογία/Υδρολογία και Ραντάρ Τηλεπισκόπησης) δύο υποψήφιων διδακτορικών φοιτητών (Dejene Sahlu & Χαϊλεγέσους Belay) από την Αιθιοπικού Ινστιντούτο Υδάτινων Πόρων, Πανεπιστήμιο της Αντίς Αμπέμπα, Αιθιοπία.

Ακαδημαϊκό έτος 2015 – 2016, 2016 – 2017, 2017 – 2018: Διδασκαλία σε προπτυχιακούς φοιτητές στο ΤΕΙ Στερεάς Ελλάδος, Σχολή Τεχνολογικών Εφαρμογών, Τμήμα Μηχανικών Αεροσκαφών Τεχνολόγων Τ.Ε., το μάθημα (Θεωρία και Εργαστήριο) «Ραντάρ – Μικροκύματα», «Εισαγωγή στην Τεχνολογία Αεροσκαφών», «Ηλεκτρικές Μηχανές»

Ακαδημαϊκό έτος 2015 – 2016, 2016 – 2017, 2017 – 2018: Διδασκαλία για το ακαδημαϊκό έτος 2015 – 2016 σε προπτυχιακούς φοιτητές του ΤΕΙ Ιονίων Νήσων, Σχολή Τεχνολογικών Εφαρμογών, Τμήμα Τεχνολόγων Περιβάλλοντος Τ.Ε., το εργαστηριακό μάθημα «Ρευστομηχανική Περιβάλλοντος» και για το ακαδημαικό έτος 2016 – 2017 και 2017 – 2018 αξιολογήθηκα ως πρώτος Επιστημονικός και Εργαστηριακός συνεργάτης για τα ακόλουθα μαθήματα: Υδρολογία (θεωρία – εργαστήριο), Τηλεπισκόπηση Περιβάλλοντος (θεωρία), Μετεωρολογία – Κλιματολογία (Εργ.) και Ρευστομηχανική Περιβάλλοντος (Εργ.)

Ακαδημαϊκό έτος 2016 – 2017: Κατάταξη αξιολόγησης έκτακτου εκπαιδευτικού προσωπικού του ΤΕΙ Κρήτης, Σχολή Τεχνολογικών Εφαρμογών, Τμήμα Φυσικών Πόρων και Περιβάλλοντος ως πρώτος για τα ακόλουθα μαθήματα: «Πειραματική Φυσική, Σχέδιο για μηχανικούς περιβάλλοντος, Υδρογεωλογία, Τεχνολογία Εντοπισμού Υδατικών Πόρων (Εργαστηριακός συνεργάτης)» και «Υδρογεωλογία, Τεχνολογία Εντοπισμού Υδατικών Πόρων (Επιστημονικοί Συνεργάτες)»

Ακαδημαϊκό έτος 2016 – 2017: Διδασκαλία του μαθήματος: «Κλιματική Αλλαγή» του ΣΤ' και Η΄ εξαμήνου (εαρινό) του τμήματος Γεωγραφίας του Χαροκόπειου Πανεπιστημίου.

Ακαδημαϊκό έτος 2017 – 2018: Διδασκαλία του μαθήματος: «Μικρο-Μετεωρολογία» του 9^{ου} εξαμήνου (χειμερινό) του τμήματος Μηχανικών Περιβάλλοντος του Δημοκρίτειου Πανεπιστημίου Θράκης.

Ακαδημαικό έτος 2017 – 2018: Επιστημονικός - Εργαστηριακός Συνεργάτης Τ.Ε.Ι. / Διδάσκων βάσει Π.Δ. 407/80 με το Ελληνικό Ανοικτό Πανεπιστήμιο (Ε.Α.Π.) νέο μέλος Συνεργαζόμενο Εκπαιδευτικό Προσωπικό (Σ.Ε.Π).

Ακαδημαικό έτος 2018 -2019: Ακαδημαικό υπότροφος του Ιονίου Πανεπιστημίου, Σχολή περιβάλλοντος, Τμήμα Περιβάλλοντος για την διδασκαλία:

Α) εργαστηριακών μαθημάτων:

- Για το χειμερινό: Προγραμματισμό Η/Υ, Ανανεώσημες Πηγές Ενέργειας Ι, Ηλεκτρική Ισχύς – Παραγωγή, Μεταφορά, Διανομή, Επιστημονικό Λογισμικό.
- Για το εαρινό: Τεχνική Υδρολογία, Ρευστομηχανική Περιβάλλοντος, Μετεωρολογία -Κλιματολογία, Βάσεις Περιβαλλοντικών Δεδομένων, Φυσική Ι

Β) θεωρία:

- Για το χειμερινό: Ηλεκτρική Ισχύς – Παραγωγή, Μεταφορά, Διανομή
- Για το εαρινό: Τεχνική Υδρολογία

Ακαδημαικό έτος 2019 – 2020:

1. Ακαδημαικό υπότροφος του Ιονίου Πανεπιστημίου, Σχολή περιβάλλοντος, Τμήμα Περιβάλλοντος για την διδασκαλία:

Α) εργαστηριακών μαθημάτων:

- Για το εαρινό: Τεχνική Υδρολογία, Ρευστομηχανική Περιβάλλοντος, Μετεωρολογία -Κλιματολογία, Βάσεις Περιβαλλοντικών Δεδομένων, Φυσική Ι

Β) θεωρία:

- Για το εαρινό: Τεχνική Υδρολογία

2. Ακαδημαικό υπότροφος του Πανεπιστημίου Θεσσαλίας, πρώην ΤΕΙ Στερεάς Ελλάδος, Σχολή Τεχνολόγων Εφαρμογών, Ηλεκτρονικών Μηχανικών, Τ.Ε.:

Α) εργαστηριακών μαθημάτων:

- Για το χειμερινό: Τηλεπικοινωνίες, Θεωρ. Πληροφορίας & Κωδικοποίηση Δεδομένων, Κεραίες
- Για το εαρινό: Ψηφιακές Τηλεπικοινωνίες, Γραμμές Μετάδοσης, Εφαρμοσμένος Ηλεκτρομαγνητισμός - Μικροκύματα

Β) θεωρία:

- Για το χειμερινό: Τηλεπικοινωνιακά Συστήματα, Κινητές & Δορυφορικές Επικοινωνίες
- Για το εαρινό: Κινητές & Δορυφορικές Επικοινωνίες, Ραντάρ – Ραδιοβοηθήματα- Ηλεκτρομαγνητική Συμβατότητα

3. Ακαδημαικό υπότροφος του Πανεπιστημίου Δυτικής Αττικής, Σχολή Μηχανικών, Τμήμα Ναυπηγών Μηχανικών: Ρευστομηχανική Ι (θεωρία – χειμερινό εξάμηνο)

4. Ακαδημαικό υπότροφος του Πανεπιστημίου Δυτικής Μακεδονίας, Σχολή Μηχανικών, Τμήμα Μηχανικών Περιβάλλοντος: Υδρολογία (θεωρία – εαρινό εξάμηνο) και Υδραυλική (θεωρία – χειμερινό εξάμηνο)

Ακαδημαικό έτος 2020 – 2021:

1. Ακαδημαικό υπότροφος του Ιονίου Πανεπιστημίου, Σχολή περιβάλλοντος, Τμήμα Περιβάλλοντος για την διδασκαλία:

Α) εργαστηριακών μαθημάτων:

- Για το χειμερινό: Γενική Χημεία και Εισαγωγή στην Χημεία Περιβάλλοντος

2. Ακαδημαικό υπότροφος του Πανεπιστημίου Θεσσαλίας, πρώην ΤΕΙ Στερεάς Ελλάδος, Σχολή Τεχνολόγων Εφαρμογών, Ηλεκτρονικών Μηχανικών, Τ.Ε.:

Α) εργαστηριακών μαθημάτων:

	• Για το χειμερινό: Τηλεπικοινωνίες, Θεωρ. Πληροφορίας & Κωδικοποίηση Δεδομένων, Κεραίες • Για το εαρινό: Ψηφιακές Τηλεπικοινωνίες, Γραμμές Μετάδοσης Β) θεωρία: • Για το χειμερινό: Τηλεπικοινωνιακά Συστήματα, Κινητές & Δορυφορικές Επικοινωνίες, Ασύρματες Ζεύξεις – Διάδοση Η/Μ Κυμάτων • Για το εαρινό: Κινητές & Δορυφορικές Επικοινωνίες, Ραντάρ – Ραδιοβοηθήματα - Ηλεκτρομαγνητική Συμβατότητα 3. Ακαδημαϊκό υπότροφος του Πανεπιστημίου Θεσσαλίας, τμήμα Φυσικοθεραπε[ας για την διδασκαλία: Εισαγωγή στην Πληροφορική (Θεωρία – Χειμερινό) 4. Ακαδημαϊκό υπότροφος του Πανεπιστημίου Θεσσαλίας, τμήμα Πολιτικών Μηχανικών για την διδασκαλία: Υπολογιστική Υδραυλική με εφαρμογές στα Υδραυλικά έργα (Θεωρία – Χειμερινό). 5. Ακαδημαϊκό υπότροφος του Πανεπιστημίου Δυτικής Μακεδονίας, τμήμα Χημικών Μηχανικών (πρώην τμήμα Μηχανικών Περιβάλλοντος) για την διδασκαλία των μαθημάτων: Μαθηματικά Ι & ΙΙΙ (Θεωρία – Χειμερινό). **Οκτωβρίου, 17 – 27, 2016:** καθηγητής κατά την διάρκεια εκπαιδευτικών σεμιναρίων κατάρτισης σε θέματα υποθαλάσσια ακουστικής κατά την διάρκεια επίσκεψης επταμελής ομάδας επιστημόνων και τεχνικών από το Institute of Oceanographic Instrument (Shandong Academy of Science). **Σεμιναριακό μάθημα** στο Π.Μ.Σ. «Ατμοσφαιρικές Επιστήμες και Περιβάλλον» του εργαστηρίου μετεωρολογίας του τμήματος Φυσικής του Πανεπιστημίου Ιωαννίνων, με τίτλο «X-band Dual-Polarization Radar: Advantages for Hydrological Purposes» **Σεμιναριακό μάθημα** στο Π.Μ.Σ. «Εφαρμοσμένη Μετεωρολογία και Φυσική Περιβάλλοντος» του τμήματος Φυσικής του Πανεπιστημίου Πατρών, με αντικείμενο τις τρέχουσες εξελίξεις και εφαρμογές στον τομέα των μετεωρολογικών ραντάρ.
Συμμετοχή σε επιτροπές διδακτορικών διατριβών και επίβλεψη πτυχιακών εργασιών **(Γ)**	**(Γ1)** Κύριος επιβλέπων σε διπλωματικές εργασίες στο Ελληνικό Ανοιχτό Πανεπιστήμιο: ΣΤΑΜΟΥΛΗ ΞΑΝΘΗ (75844), ΔΗΜΗΤΡΟΠΟΥΛΟΥ ΜΑΓΔΑΛΗΝΗ (115825) και ΠΑΝΤΕΛΙΑΣ ΓΕΩΡΓΙΟΣ (91468) (**Γ2**) Συν-επίβλεψη πτυχιακής διδακτορικής εργασίας και μέλος της τριμελής επιτροπής της Yagmur Derin (PhD), Τμήμα Πολιτικών & Περιβ. Μηχ., Πανεπιστήμιο του Κοννέκτικατ, ΗΠΑ, αναμενόμενη ημερομηνία ολοκλήρωσης, Σεπτ. 2019. **(Γ3)** Κύριος επιβλέπων πτυχιακής εργασίας και συμμετοχή στην τριμελή επιστροπή της Βασιλικής Βλαχοπούλου και της Ανδρονίκης Μπαρμπούνη, σχολής Τεχνολογικών Εφαρνογών, Τμήμα Τεχνολόγων Περιβάλλοντος Τ.Ε. (**Γ4**) Συν-επίβλεψη πτυχιακής εργασίας και συμμετοχή στην τριμελή επιτροπή των Θέμη Γιώτα, σχολής Τεχνολογικών Εφαρμογών, Τμήμα Πολιτικών Μηχανικών Τ.Ε. με ημερομηνία ολοκλήρωσης, Ιούλιος. 2017.
Ερευνητική Δραστηριότητα - Επαγγελματικές δεξιότητες **(Δ)**	**Αξιολογητης Ερευνητικων Προτασεων και Επιστημονικων Αρθρων (Δ1):** **<u>Σεπτέμβριος 2017 (Δ1.1):</u>** προσκεκλημένος αξιολογητής για την αξιολόγηση προτάσεων για το Cost Association (OC-2017-1). **<u>Αύγουστος 2017 (Δ1.2):</u>** προσκεκλημένος αξιολογητής για την αξιολόγηση προτάσεων για το Ευρωπαϊκό ERANETRUS-PLUS S&T 2017. **<u>Μάρτιος 2017 (Δ1.3):</u>** προσκεκλημένος αξιολογητής επιχειρηματικών σχεδίων της Δράσης «Αναβάθμιση πολύ μικρών & μικρών επιχειρήσεων για την ανάπτυξη των ικανοτήτων τους στις νέες αγορές». **<u>Ιούνιος 2015 (Δ1.4):</u>** προσκεκλημένος εμπειρογνωμόνων - αξιολογητών για την αξιολόγηση των προτάσεων «Ολοκληρωμένη Διαχείριση Θαλάσσιων και Εσωτερικών Υδάτων (Integrated Marine and Inland Water Management)» του Χρηματοδοτικού Μηχανισμού (ΧΜ) του Ευρωπαϊκού Οικονομικού Χώρου (ΕΟΧ). **<u>Δεκέμβριος 2014 – Ιανουάριος 2015 (Δ1.5):</u>** προσκεκλημένος panelist/κριτικός για την αξιολόγηση των προτάσεων για το Ευρωπαϊκό ICT-AGRI Meta Knowledge Base call (***http://www.ict-agri.eu/***) **<u>Κριτής σε διεθνή περιοδικά:</u>** Advances in Geoscience, Journal of Hydrology, Journal of Hydrometeorology, Journal of Atmospheric and Oceanic Technologies, IEEE Letters in Geosciences and remote sensing, IEEE Transactions in Geosciences and remote sensing, Atmospheric Science. **Τιμητικές και άλλες Διακρίσεις:** **<u>Δεκέμβριος 2009:</u> Who's Who in the World, 27η έκδοση.** **<u>Σεπτέμβριος, 2006 (Δ2):</u> Αναβολή κατάταξης ως κάτοχος διδακτορικού διπλώματος και διακεκριμένοι επιστήμονες, σε επιστημονικές εργασίες και έρευνες στο εξωτερικό (ΣΑ: 100/237/97, Φ.429.1/5/150045/Σ.11/4 Ιαν 06 Αποφ. ΥΦΕΘΑ).** **<u>Αύγουστος, 2002:</u> Group Achievement Award – Fourth Convection and Moisture Experiment (CAMEX 4) - NASA.** **Μέλος Επιστημονικών/Ερευνητικών Ενώσεων και Επιμελητηρίων:** 1. Μέλος της επιστημονικής επιστροπής για την εκτίμηση της κατάστασης των Ελληνικών θαλασσών για τον υποθαλάσσιο θόρυβο βάση της «Περιγραφής 11» της Ευρωπαικής Οδηγίας για την «Παρακολούθηση των δεικτών της οδηγίας πλαίσιο για την θαλάσσια στρατηγική». 2. Σύλλογος Αποφοίτων Marie Curie, American Geophysical Union, European Geophysical Union, Εμπορικού και Βιομηχανικού Επιμελητηρίου Κέρκυρας, Γενικό Εμπορικό Μητρώο. 3. Μέλος της Τεχνικής Επιτροπής για την κατακρήμνιση (AGU Technical Committee on precipitation) της Αμερικάνικης Ένωσης Γεωπιστημών (<u>http://hydrology.agu.org/committees/</u>) 4. Αξιολογητής Φοιτητικών Ταξιδιωτικών Επιδοτήσεων για το AGU Fall Meeting (2017).

© Ευρωπαϊκή Ένωση, 2002-2013 | http://europass.cedefop.europa.eu

	5. Μέλος της διεθνής επιτροπής του 5ου Διεθνή συνέδριου στην Τηλεπισκόπιση και Γεωπληροφορική του Περιβάλλοντος, 20 – 23 Μαρτίου 2017, Κύπρο (http://www.cyprusremotesensing.com/rscy2017/Committees) **Μέλος Μητρώων Πιστοποιημένων Αξιολογητών/Ελεγκτών** 1. *Εθνικό Κέντρο Τεκμηρίωσης:* Επιστημονική υποστήριξη υλοποίησης δράσεων συγχρηματοδοτούμενων έργων 2. *Γενική Γραμματεία Στρατηγικών και Ιδιωτικών Επενδύσεων, Υπουργείο Οικονομίας, Ανάπτυξης και Τουρισμού*: Πιστοποιημένο Μέλος Ελεγκτών και Αξιολογητών 3. *ΕΦΕΠΑΕ/ΕΥΔΕ-ΕΤΑΚ*: Μέλος Εθνικών Πιστοποιημένων Αξιολογητών/Ελεγκτών 4. *ΓΓΕΤ*: Μέλος Αξιολογητών **Προεδρείο Συνεδρίας:** 1. *"Ambient noise: sources, monitoring and long term trends" session, of the 3rd Underwater Acoustics Conference and Exhibition, Platanias, Crete, Greece.* 2. *"Advances in acoustic measurement systems: Technologies and applications " session, of the 4th Underwater Acoustics Conference and Exhibition, Skiathos Island, Greece.*
Κύριες Ερευνητικές Διακρίσεις	Υποτροφία με βάση τη Χορηγία Αριστείας (Excellence Grant) Marie Curie στα πλαίσια του 6ου Προγράμματος-Πλαισίου της Ευρωπαϊκής Ένωσης. Marie Curie Fellowship (2009 – 2010): Marie Curie Intra-European Fellowships for Career Development (IEF) Ενίσχυση Μεταδιδακτόρων ερευνητών/τριών (Μ.Ε) του Επιχειρησιακού Προγράμματος «Εκπαίδευση και Δια Βίου Μάθηση» (2012 – 2014). Κρατική επιχορήγηση του Υπουργείου Παιδείας σε συνεργασία με το Ευρωπαϊκό Κοινωνικό Ταμείο και την Ευρωπαϊκή Ένωση για την υποστήριξη νέων μεταδιδακτορικών ερευνητών/τριών. Η ερευνητική πρόταση του Δρ. Μάριου Ν. Αναγνώστου, με τίτλο «Αναπτύσσοντας τις υδρομετεωρολογικές χρήσεις μετεωρολογικού ραντάρ διπλής πολικότητας στην μπάντα συχνοτήτων Χ» μετά από την αξιολόγηση της από διεθνείς αξιολογητές εγκρίθηκε για χρηματοδότηση να υλοποιηθεί στο το Ινστιτούτο Ερευνών Περιβάλλοντος και Βιώσιμης Ανάπτυξης (ΙΕΠΒΑ) του Εθνικού Αστεροσκοπείου Αθηνών (ΕΑΑ).
Τεχνικές δεξιότητες και ικανότητες	Οι ειδικές γνώσεις του ερευνητή είναι σε τελευταίας τεχνολογίας (4ης γενιάς) υδρομετεωρολογικών και ωκεανογραφικών συστημάτων τηλεπισκόπησης, όπως είναι: δορυφορικά συστήματα, ραντάρ, υποθαλάσσιοι παθητικοί ακουστικοί αισθητήρες, όπως επίσης και τελευταίας γενιάς αλγορίθμων που αφορούν μετρήσεις κατακρήμνισης με τηλεπισκοπικά συστήματα, ανάπτυξη αλγορίθμων συλλογής και επεξεργασίας πρωτογενών μετρήσεων, διόρθωση εξασθένισης σήματος από τη βροχόπτωση με μετρήσεις μετεωρολογικού ραντάρ συχνότητας εκπομπής Χ, εντοπισμού και διόρθωση μετρήσεων εξαιτίας του φυσικού μηχανισμού ενίσχυσης της ανακλασώμενης ενέργειας που δημιουργούνται σε υψόμετρο μηδενικής θερμοκρασίας, και πολλά άλλα, με εφαρμογή για την ανάλυση ατμοσφαιρικών και επιφανειακών υδρολογικών διαδικασιών του υδρολογικού κύκλου σε διάφορες χωροχρονικές κλίμακες. Ένας άλλος τομέας της επιστημονικής μου έρευνας είναι η χρήση υποβρυχίων ακουστικών συστημάτων για τη μέτρηση των χωρικών περιβαλλοντικών παραμέτρων στην επιφάνεια της θάλασσας (άνεμοι επιφανείας, βροχόπτωση, τύπος βροχής). Οι μετρήσεις της βροχόπτωσης και της ταχύτητας του ανέμου στην ανοικτή θάλασσα και στους ωκεανούς με τη χρήση υποβρυχίων ακουστικών τεχνικών αποτελούν μία πιθανή μεθοδολογία επικύρωσης των δορυφορικών μετρήσεων.
Επικοινωνιακές δεξιότητες Οργανωτικές / διαχειριστικές δεξιότητες	- πάρα πολύ καλή επικοινωνιακή δεξιότητα και μεταδοτική ικανότητα με προπτυχιακούς και μεταπτυχιακούς φοιτητές που αποκτήθηκε από την εμπειρία μου. - πολύ καλές οργανωτικές ικανότητες στην συγγραφή ερευνητικών προτάσεων για Ελληνικά και Ευρωπαϊκά προγράμματα με πάρα πολύ καλή επιτυχία (Marie Curie, Ελληνικό Post-doc, κτλ.) - πάρα πολύ καλή οργανωτική ικανότητα στην διαχείριση ευρωπαϊκών προγραμμάτων.
Δεξιότητες πληροφορικής	- πάρα πολύ καλός χειρισμός των τελευταίων λειτουργικών συστημάτων Microsoft Windows, Linux και UNIX - πάρα πολύ καλός χειρισμός του Microsoft Office και Windows 10 - εξαιρετική γνώση της MatLab, C/C++ και καλής γνώσης της Fortran. - πολύ καλή γνώση του ArcGIS/QGIS (πιστοποιητικό επιμόρφωσης από εξ'αποστάσεως πρόγραμμα του ΕΚΠΑ)

Ερευνητικά Προγράμματα (αντίγραφα έγκρισης έργων είναι διαθέσιμα αν ζητηθούν) **(Ε)**

Ο υποψήφιος είναι επιστημονικός υπεύθυνος στα παρακάτω εκτελεσθέντα ερευνητικά/επιχειρηματικά προγράμματα:

1. **Advancing small-scale hydrometeorological predictions through mobile X-band dual-polarization radar systems: methods, algorithms and applications (HYDREX)**, FP7-PEOPLE-2009-IEF, επιστημονικός υπεύθυνος του έργου ο Μ. Ν. Αναγνώστου και συνοτνιστής από το Πανεπιστήμιο Σαπιένζα της Ρώμης ο καθ. F. S. Marzano, συνεργάτες: καθ. M. Borga, προυπολογισμός του έργου:173.258,85€ (2010 – 2012). (**Ε1**)
2. **Υδρομετεωρολογικά και Θαλάσσια Τεχνολογικά Συστήματα Τηλεπισκόπισης (HORST)**, για την ανάπτυξη και δημιουργία νέων ερευνητικών και καινοτομων υπηρεσιών και συστημάτων τηλεπιστκόπισης για το Περιβάλλον στα πλαίσιο της δράσης «Νέα - Καινοτομική Επιχειρηματικότητα» του Επιχειρησιακού Προγράμματος Ανταγωνιστικότητας και Επιχειρηματικότητας (Δικαιούχος Δράσης: Γενική Γραμματεία Βιομηχανίας του Υπουργείου Ανάπτυξης, Ανταγωνιστικότητας και Ναυτιλίας) συγχρηματοδοτούμενο από το Ευρωπαϊκό Κοινωτικό Ταμείο (ΕΚΤ) και το Ελληνικό Δημόσιο (ΕΣΠΑ 2007 – 2013), με κωδικό έργου: **ΝΕΚ - 00989**, συντονισμός διαχείρησης και επιστημονικός υπεύθυνος του έργου ο Δρ. Μ. Ν. Αναγνώστου, προυπολογισμός έργου: 217.201 € (2012 - 2014). (**Ε2**)
3. **Advancing hydrometeorological uses of X-band dual-polarization radar (HYDRO-X)**, στο πλαίσιο της Δράσης «Ενίσχυση Μεταδιδακτόρων Ερευνητών» του Επιχειρησιακού Προγράμματος «Εκπαίδευση και Δια Βίου Μάθηση» (Δικαιούχος Δράσης: Γενική Γραμματεία Έρευνας και Τεχνολογίας), συγχρηματοδοτείται από το Ευρωπαϊκό Κοινοτικό Ταμείο (ΕΚΤ) και το Ελληνικό Δημόσιο, με κωδικό έργου: ΡΕ10 (975) HYDRO-X, οικονομική διαχείριση του έργου ο Ειδικός Λογαριασμός Κονδυλίων Έρευνας του Εθνικό Αστεροσκοπείο Αθηνών, συντονιστής και επιστημονικός υπεύθυνος του έργου ο Μ. Ν. Αναγνώστου, συνεργάτες: Δρ. Ιωάννης Καλόγηρος και Δρ. Ευθύμιος Νικολόπουλος,προυπολογισμός έργου: 128.400,00 € (2012-2014). (**Ε3**)
4. **Underwater Sound and Radon Measurements of Rainfall and Wind at Sea: Demonstration**, FixO3 Transnational Access (TNA) Proposal: επιστημονικός υπεύθυνος για την ΩΥΣΤ Μ. Ι.Κ.Ε. ο Μ. Ν. Αναγνώστου και για το ΕΛΚΕΘΕ ο Χρήστος Τσαμπάρης, προυπολογισμός έργου: 6.000€ (2016 – σήμερα). (**Ε4**)

Ο υποψήφιος ήταν/είναι επιστημονικός (συν-) υπεύθυνος / συνεργάτης στα παρακάτω ερευνητικά προγράμματα:

5. The International H_2O Project (**IHOP**), NSF Grand (2002 – 2004).
6. Spatial Averaging of Oceanic Rainfall Variability Using Underwater Sound (**ISREX**), NSF Grand (2004 – 2006).
7. Hydrometeorological data resources and technologies for effective flash flood forecasting (**HYDRATE**), EU 4th Call of the Energy, Environment and Sustainable Development Programme - STREP Project, προυπολογισμός έργου: 170,000 από ΕΚΤ και 80,000 από Γενική Γραμματεία Έρευνας και Τεχνολογίας (2006 – 2008).
8. 1η Ευρωπαικός Οργανισμός Διαστήματος – Ελλάδα στα πλαίσια της δράσης «Industry Incentive Scheme» με κωδικό έργου: Co # 22239 RST Ltd – ESA, για την δημιουργεία ενός πρωτότυπου υποθαλάσσιου ακουστικού συστήματος (PAL: Passive Aquatic Listener), προυπολογισμός έργου: 100.000€ (2008 – 2010).
9. Advancing the predictability of water cycle through an improved understanding of land surface and coastal water processes and optimal integration of models with observational data (**PreWEC**), EU Marie Curie Excellence Grant, Scientist in Charge: 1,400,000€ από το ΕΚΤ και 300,000€ από την ΓΓΕΤ (2008 – 2010).
10. Integrated advanced distributed system for hydro-meteorological monitoring and forecasting using low-cost high-performance X-band mini-radar and cellular network infrastructures (**HYDRORAD**), έρευνα για όφελος μικρο-μεσαίων εταιρειών από το πακέτο fp6. (2010 – 2012).
11. **Earth2Observe**: Global Earth Observation for integrated water resource assessment. FP7-ENV-2013, contract # 603608. 2014-2017. (2014 - σήμερα).
12. **WASFF – II**: Saudi Aramco σε συνεργασία με την WeMET I.K.E. στην Ελλάδα για την δημιουργία ενός επιχειρησιακού ολοκληρωμένου συστήματος καιρού και θαλάσσιας κατάστασης (2016 – σήμερα).
13. **myPAL/myPAL-NET:** H2020-SME-Instrument, Ευρωπαικό πρόγραμμα για εταιρείας, φάση 1 (2019 – σήμερα).

Αναγνωριση του Ερευνητικου Εργου **(ΣΤ)**

Author ID: 7006484268
h-index = 12 (από Scopus 2020)
38 cited documents

	<2009	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Συνολικά
Συνολικά:	52	27	26	15	25	44	33	30	34	34	28	348

Το επιστημονικό έργο έχει σημοσιευθεί σε Διεθνή Επιστημονικά Περιοδικα΄με κριτές του SCI. Ο συντελεστής βαρύτητας (Impact Factor) των Περιοδικών κυμαίνεται από 0.6 έως και 7.9 (μέση τιμή IF = 3.44)

© Ευρωπαϊκή Ένωση, 2002-2013 | http://europass.cedefop.europa.eu

ΔΗΜΟΣΙΕΥΣΕΥΣΕΩΝ / ΕΡΓΑΣΙΩΝ **(H)**

Συνοψη Δημοσιευμενου Εργου

Διατριβές	2
Συμμετοχή στη συγγραφή βιβλίων	4
Δημοσιεύσεις σε διεθνή επιστημονικά περιοδικά με κριτές	35
Δημοσιεύσεις σε πρακτικά συνεδρίων με κριτές	49
Δημοσιεύσεις περιλήψεων σε πρακτικά συνεδρίων	20
Τεχνικές εκθέσεις	1

Σύνοψη του δημοσιευμένου έργου σε ανοικτές βάσεις δεδομένων

https://scholar.google.com/citations?hl=el&user=eREN_IAAAAAJ&view_op=list_works&sortby=pubdate

https://www-scopus-com.scopeesprx.elsevier.com/authid/detail.uri?authorId=7006484268#

Διατριβές (αντίγραφα είναι διαθέσιμα αν ζητηθούν)

- **Anagnostou, M. N.**, Doctor of Philosophy Thesis, submitted-accepted November 2006: "Mobile High Resolution X-Band Polarimetric Doppler Weather Radar Measurements (XPOL): Evaluation and Application", University of Connecticut, Storrs, USA.
- **Anagnostou, M. N.**, Master of Engineering Thesis, submitted-accepted June 2000: "Conceptual design of an air-to-ground and air-to-air Ultrawide band data link system", Unicersity of York, York, U.K.

Υπόμνημα (με περιλήψεις) των Δημοσιευσεων (στα αγγλικά) σε Επιστημονικα Περιοδικα με Κριτες (Η)

Peer review journals (papers published, accepted, or submitted):

- **(H1.1)** Yagmur D., Md Abul Ehsan Bhuiyan, Emmanouil N. Anagnostou, Marios N. Anagnostou, and John Kalogiros, 2020: "Modeling Level 2 Passive Microwave Precipitation Retrieval Error over Complex Terrain Using a Nonparametric Statistical Technique", Submitted to: IEEE Transactions on Geoscience and Remote Sensing.

The representation of high rainfall variability over mountainous areas using ground-based sensors is an open problem in hydrometeorological applications that necessitates the use of satellite-based precipitation products (SPPs) because of their ability to represent the space-time variability of rainfall with quasi-global coverage. An extended network of ground-based X-band radar (GR) deployments over multiple complex terrain areas, including the northeastern Italian Alps, North Carolina, Olympic Mountain, and the southern tip of Vancouver Island, are used in this study as a benchmark rainfall dataset for error characterization and modeling of Level 2 PMW retrievals (Goddard profiling (GPROF) V05 algorithm) for the different sensors: the Microwave Humidity Sounder (MHS), the Special Sensor Microwave Imager/Sounder (SSMIS), the Global Precipitation Measurement Microwave Imager (GMI), and the Advanced Microwave Scanning Radiometer 2 (AMSR2) sensors. Matchups of Level 2 PMW/GR rainfall are extracted based on a matching methodology that identifies GR volume scans coincident with PMW overpasses, and scales GR parameters to the satellite products' nominal spatial resolution. The Level 2 PMW error model described in this study is the nonparametric machine learning tree-based Quantile Regression Forest (QRF), which we developed using matchups of PMW/GR rainfall data from the different study areas. Validation of the error model is conducted by using three different cross-validation techniques: the k-fold, leave-one region out and enforced. All validations showed that the error model can significantly reduce both mean relative error and the random component of PMW products. Moreover, the error reduction demonstrated with the leave-one region out cross validation technique indicated that the error model is transferable among complex terrain regions. Algorithm developers may find this error model useful to integrate in the Level 3 products.

- **(H1.2)** Taylor, W. O, M. N. Anagnostou, D. Cerrai, and E. N. Anagnostou, 2020: "Machine Learning Methods to Approximate Rainfall and Wind from Acoustic Underwater Measurements", IEEE Transactions on Geoscience and Remote Sensing (under publication) 10.1109/TGRS.2020.3007557

One method of measuring precipitation and wind over the ocean is through analysis of the underwater ambient acoustics. In this study the ambient ocean noises recorded by a passive aquatic listener in the Mediterranean are used to compare the effectiveness of machine learning techniques for measuring wind speed and precipitation rate to empirical methods from previous works. The data was collected over the timeframe of June 2011 to May 2012 and included two storms that caused severe coastal flooding in Genoa, Italy. A spar buoy at the surface above the passive acoustic listener provided high quality in-situ measurements to act as reference data for model training and validation. Results using machine learning models show correlation coefficients of 0.95 between the acoustic data and wind speed, and a reduction in unexplained variance by over a third from previous methods. For precipitation, CatBoost and random forest models are used to measure total precipitation for twelve events using leave-one-event-out cross validation, demonstrating mean errors of 27.82% and 33.63%, and median errors of 18.34% and 16.74% respectively The ability to measure wind and precipitation by applying machine learning on data from underwater acoustic recorders shows potential to help improve in-situ measurements over oceans globally.

- **(H2)** Yagmur Derin, Emmanouil Anagnostou, **Marios N. Anagnostou**, and John Kalogiros, 2019: "Evaluation of X-Band Dual Polarization Radar-Rainfall Estimates from OLYMPEX", Journal of Hydrometeorology, Vol. 24, pp. 1941 – 1959, https://doi.org/10.1175/JHM-D-19-0097.1

The difficulty of representing high rainfall variability over mountainous areas using ground-based sensors is an open problem in hydrometeorology. Observations from locally deployed dual-polarization X-band radar have the advantage of providing multiparameter measurements near ground that carry significant information useful for estimating drop size distribution (DSD) and surface rainfall rate. Although these measurements are at fine spatiotemporal scale and are less inhibited by complex topography than operational radar network observations, uncertainties in their estimates necessitate error characterization based upon in situ measurements. During

November 2015–February 2016, a dual-polarized Doppler on Wheels (DOW) X-band radar was deployed on the Olympic Peninsula of Washington State as part of NASA's Olympic Mountain Experiment (OLYMPEX). In this study, rain gauges and disdrometers from a dense network positioned within 40 km of DOW are used to evaluate the self-consistency and accuracy of the attenuation and brightband/ vertical profile corrections, and rain microphysics estimation by SCOP-ME, an algorithm that uses optimal parameterization and best-fitted functions of specific attenuation coefficients and DSD parameters with radar polarimetric measurements. In addition, the SCOP-ME precipitation microphysical retrievals of median volume diameter D_0 and normalized intercept parameter N_W are evaluated against corresponding parameters derived from the in situ disdrometer spectra observations.

- **(H3)** George Varlas, **Marios N. Anagnostou**, Christos Spyrou, Anastasios Papadopoulos, John Kalogiros, Angeliki Mentzafou, Silas Michaelides, Evangelos Baltas, Efthymios Karymbalis and Petros Katsafados, 2019: « A multi-platform hydrometeorological analysis of the flash flood event of 15 November 2017 in Attica, Greece», MDPI, Remote Sens., 11, 45; doi:10.3390/rs11010045

Urban areas often experience high precipitation rates and heights associated with flash flood events. Atmospheric and hydrological models in combination with remote-sensing and surface observations are used to analyze these phenomena. This study aims to conduct a hydrometeorological analysis of a flash flood event that took place in the sub-urban area of Mandra, western Attica, Greece, using remote-sensing observations and the Chemical Hydrological Atmospheric Ocean Wave System (CHAOS) modeling system that includes the AdvancedWeather Research Forecasting (WRF-ARW) model and the hydrological model (WRF-Hydro). The flash flood was caused by a severe storm during the morning of 15 November 2017 around Mandra area resulting in extensive damages and 24 fatalities. The X-band dual-polarization (XPOL) weather radar of the National Observatory of Athens (NOA) observed precipitation rates reaching 140 mm/h in the core of the storm. CHAOS simulation unveils the persistent orographic convergence of humid southeasterly airflow over Pateras mountain as the dominant parameter for the evolution of the storm. WRF-Hydro simulated the flood using three different precipitation estimations as forcing data, obtained from the CHAOS simulation (CHAOS-hydro), the XPOL weather radar (XPOL-hydro) and the Global Precipitation Measurement (GMP)/Integrated Multi-satellitE Retrievals for GPM (IMERG) satellite dataset (GPM/IMERG-hydro). The findings indicate that GPM/IMERG-hydro underestimated the flood magnitude. On the other hand, XPOL-hydro simulation resulted to discharge about 115 m3/s and water level exceeding 3 m in Soures and Agia Aikaterini streams, which finally inundated. CHAOS-hydro estimated approximately the half water level and even lower discharge compared to XPOL-hydro simulation. Comparing site-detailed post-surveys of flood extent, XPOL-hydro is characterized by overestimation while CHAOS-hydro and GPM/IMERG-hydro present underestimation. However, CHAOS-hydro shows enough skill to simulate the flooded areas despite the forecast inaccuracies of numerical weather prediction. Overall, the simulation results demonstrate the potential benefit of using high-resolution observations from a X-band dual-polarization radar as an additional forcing component in model precipitation simulations.

- **(H4)** Sara Pensieri, Dionisios Patiris, Stylianos Alexakis, **Marios N. Anagnostou**, Aristides Prospathopoulos, Christos Tsabaris, and Roberto Bozzano, 2018: "Integration of underwater radioactivity and acoustic sensors into a near real-time multi-parametric observing system at open sea," Sensors, MDPI, 18, 2737; doi:10.3390/s18082737

This work deals with the installation of two smart in-situ sensors (for underwater radioactivity and underwater sound monitoring) to the Western 1 - Mediterranean Moored Multisensor Array ocean observing system that is equipped with all appropriate modules for continuous, long-term and real-time operation. All necessary tasks for their integration are described such as, the upgrade of the sensors for interoperable and power-efficient operation, the conversion of data in homogeneous and standard format, the automated pre-process of the raw data, the real-time integration of data and metadata (related to data processing and calibration procedure) into the controller of the observing system, the test and debugging of the developed algorithms in the laboratory, and the obtained quality-controlled data. The integration allowed the transmission of the acquired data in near-real time along with a complete set of typical ocean and atmospheric parameters. Preliminary analysis of the data are presented, providing qualitative information during rainfall periods, and combine gamma-ray detection rates with passive acoustic data. The analysis exhibits a satisfactory identification of rainfall events by both sensors according to the estimates obtained by the rain gauge operating on the observatory and the remote observations collected by meteorological radars.

- **(H5) Anagnostou, M. N.,** E. I. Nikolopoulos, J. Kalogiros, E. N. Anagnostou, F. Marra, E. Mair, G. Bertoldi, U. Tappeiner, and M. Borga, 2018: "Advancing Precipitation Estimation and Streamflow Simulations in Complex Terrain with X-Band Dual-Polarization Radar Observations," Remote Sens., Vol. 10, 1258; https://doi.org/10.3390/rs10081258.

In mountain basins, the use of long-range operational weather radars is often associated to poor quantitative precipitation estimation due to a number of challenges posed by the complexity of terrain. As a result, the applicability of radar-based precipitation estimates for hydrological studies is often limited over areas that are in close proximity to the radar. This study evaluates the advantages of using X-band polarimetric (XPOL) radar as a means to fill the coverage gaps and improve precipitation estimation and associated hydrological applications in complex terrain basins. Corresponding rainfall estimates from two operational C-band weather radar observations are compared to the XPOL rainfall estimates for a near-range (10–35 km) mountainous basin (64 km^2) in the Northeast Italian Alps. In situ rainfall observations from a dense rain gauge network and two disdrometers (a 2D-video and a Parsivel) are used for ground validation of the radar-rainfall estimates. Ten storm events over a period of two years are used to explore differences between the locally deployed XPOL vs. longer-range operational radar-rainfall error statistics. Hourly aggregate rainfall estimates by XPOL, corrected for rain-path attenuation and vertical reflectivity profile, exhibited correlations between 0.70 and 0.99 against reference rainfall data and 21% mean relative error for rainfall rates above 0.2 mm h^{-1}. The corresponding metrics from the operational radar-network rainfall products gave strong underestimation (50 - 70%) and lower correlations (0.48 - 0.81). For the two highest flow-peak events a hydrological model (Kinematic Local Excess Model) was forced with the different radar-rainfall estimations and in situ raingauge precipitation data at hourly resolution, exhibiting close agreement between the XPOL and gauge-based driven runoff simulations, while the simulations obtained by the operational radar rainfall products resulted in a greatly underestimated runoff response.

- **(H6)** Erlingis, J. M., J. J. Gourley, P-E Kirstetter, E. N. Anagnostou, J. Kalogiros, **M. N. Anagnostou**, and W. Petersen, 2018: "Evaluation of Operational and Experimental Precipitation Algorithms and Microphysical Insights during IPHEx", J. Hydrometeor., Vol. 19, pp. 113 – 125; (https://doi.org/10.1175/JHM-D-17-0080.1)

During May and June 2014, NOXP, the National Severe Storms Laboratory's dual-polarized X-band radar was deployed in the Pigeon River Basin in the Smoky Mountains of North Carolina as part of the NASA Integrated Precipitation and Hydrology Experiment. Rain gauges and disdrometers were positioned within the basin to verify precipitation estimates from various radar and satellite precipitation algorithms. First, the performance of the SCOP-ME algorithm for NOXP was examined using ground instrumentation as validation and was found to outperform other precipitation algorithms over the course of the Intensive Observation Period (IOP). Radar data were also used to examine ridge-valley differences in radar and microphysical parameters for a case of stratiform precipitation passing over the mountains. Inferred coalescence microphysical processes were found to dominate within the upslope region, while a combination of processes were present as precipitation propagated over the valley. This suggests that enhanced updrafts aided by orographic lift sustain convection over the upslope regions, leading to larger median drop diameters.

- **(H7)** Derin, Y., E. N. Anagnostou, **M. N. Anagnostou**, J. Kalogiros, D. Casella, Anna C. Marra, G. Panegrossi, and P. Sanò, 2018: "Passive microwave rainfall error analysis using high-resolution X-band dual-polarization radar observations in complex terrain", IEEE Tran. on Geosc. and Remo. Sens., Vol. 56, pp. 2565 – 2586; (10.1109/TGRS.2017.2763622)

Difficulties in representation of rainfall variability using ground-based sensors over mountainous areas necessitate the use of high resolution satellite precipitation datasets from combined passive microwave (PMW) and geostationary infrared observations. The accuracy of these datasets depends greatly on the uncertainty characteristics of the PMW sensor retrievals and sampling frequency. In this paper we evaluate the retrieval error characteristics from the different PMW sensors over mountainous terrain using high temporal and spatial resolution ground-based radar (GR) reference rainfall datasets from two field experiments: one in the mid-Atlantic East Coast of the United States and the second in the Northeastern Italian Alps. We extracted matchups of PMW/GR rainfall based on a matching methodology that identifies GR volume scans coincident with PMW overpasses, and scales GR parameters to the satellite products' nominal spatial resolution. Different PMW precipitation retrieval algorithms are evaluated: the NASA Goddard PROFiling algorithm (GPROF), standard and climatology-based products, in both version 3 and version 4 and version 5 for four PMW sensors (SSMIS, MHS, GMI, and AMSR2), and the algorithms Cloud Dynamics and Radiation Database (CDRD) for SSMIS and Passive microwave Neural network Precipitation Retrieval (PNPR) for AMSU/MHS, used operationally within the EUMETSAT Satellite Application Facility on support to Operational Hydrology and Water Management (H-SAF). The error analysis shows varying error characteristics across different PMW retrievals, and the magnitude dependent systematic error, going from overestimation or weak underestimation of light precipitation to mainly underestimation of heavier precipitation, shows weak covariation with the ground reference. GPROF V05 algorithm depicted significant improvement over its previous versions (V03 and V04). In general, the GPROF-CLIM algorithm and GPROF V05 showed better performance in terms of correlation and systematic error for both regions.

- **(H8)** Porcacchia, L., P-E Kirstetter, J. J. Gourley, V. Maggioni, B. L. Cheong, **M. N. Anagnostou**, and J. Kalogiros, 2017: "Toward a Radar Polarimetric Classification Scheme for Warm-Rain Precipitation: Application to Complex Terrain", J. Hydrometeor., Vol. 18, pp. 3199 – 3215; (https://doi.org/10.1175/JHM-D-17-0016.1)

Accurate quantitative precipitation estimation over mountainous basins is of great importance because of their susceptibility to natural hazards. It is generally difficult to obtain reliable precipitation information over complex areas, due to the scarce coverage of ground observations, the limited coverage from operational radar networks and high elevation of the study sites. Warm-rain processes have been observed in several flash flood events in complex terrain regions. While they lead to high rainfall rates from precipitation growth due to collision-coalescence of droplets in the cloud liquid layer, their characteristics are often difficult to identify. X-band mobile dual-polarization radars located in complex terrain areas provide fundamental information at high-resolution and at low atmospheric levels. This study analyzes a dataset collected during the iPHEx (North Carolina, US) field campaign in 2014 over a mountainous basin where the NOAA/National Severe Storm Laboratory's NOXP X-band dual-polarization radar was deployed. Polarimetric variables are used to isolate collision-coalescence microphysical processes. This work lays the basis for classification algorithms able to identify coalescence dominant precipitation by merging the information coming from polarimetric radar measurements. The sensitivity of the proposed classification scheme is tested with different rainfall rate retrieval algorithms and compared to rain gauge observations. Results show the inadequacy of rainfall estimates when coalescence identification is not taken into account. This work highlights the necessity of a correct classification of collision-coalescence processes, which can lead to improvements in quantitative precipitation estimation. Future studies will aim at generalizing this scheme making use of space-borne radar data.

- **(H9)** Pensieri S., R. Bozzano, J. A. Nystuen, E. N. Anagnostou, **M. N. Anagnostou**, and R. Bechini, 2015: "Underwater acoustic measurements to estimate wind and rainfall in the Mediterranean Sea," Advances in Meteorology Volume 2015, Article ID 612512, 18 pages; (http://dx.doi.org/10.1155/2015/612512)

Oceanic ambient noise measurements can be analyzed to obtain qualitative and even quantitative information about wind and rainfall phenomena over the ocean filling the existing gap of reliable meteorological observations at sea. The Ligurian Sea Acoustic Experiment was designed to collect long-term synergistic observations from a passive acoustic recorder and surface sensors (i.e. buoy mounted rain gauge and anemometer and weather radar) to support error analysis of rainfall rate and wind speed quantification techniques developed on past studies. A low duty-cycle broadband (1 - 50 kHz) underwater passive acoustic recorder was deployed for an extended period of time (one year) at 36 meter depth on a spar type buoy located in the Ligurian Sea.The study period included combination of high and low wind and rainfall episodes and two storm events that caused the catastrophic floods of October and November 2011 in the vicinity of La Spezia and Cinque Terre and in the city of Genoa, respectively. The availability for the first time of high resolution in-situ meteorological data allows to improve data processing technique to detect and especially to provide effective estimates of wind and rainfall at sea. Results show a very good correspondence between estimates provided by passive acoustic recorder algorithm and in-situ observations for both rainfall and wind phenomena and demonstrates the potential of using measurements provided by passive acoustic instruments in open sea for early warning of approaching coastal storms, which for the Mediterranean coastal areas constitutes one of the main causes of recurrent floods.

- **(H10)** Nystuen, J. A., **M. N. Anagnostou**, E. N. Anagnostou, and A. Papadopoulos, 2015: "Monitoring Greek seas using passive underwater acoustics," Journal of Atmo. and Ocean. Tech. vol 32, pp. 334 – 348.

The Hellenic Center for Marine Research POSEIDON ocean monitoring and forecasting system ocean has included passive underwater acoustic measurements as part of its real-time operations. Specifically, low duty cycle long-term passive acoustic recorders (PALs) are deployed on two operational buoys, one at Pylos in the Ionian Sea and the second at Athos in the northern Aegean Sea. As a first step towards the quantitative use of passive ambient sound, classification of the sounds from geophysical sources, e.g. wind and rain, is separated from the noise of shipping, other anthropogenic activities, and from the natural sounds of marine animals. After classification, quantitative measurements of wind speed and precipitation are applied to the ambient sound data. Comparisons are made with in situ measurements of wind speed and co-located measurements of precipitation from operational weather radar. The complicated condition of high sea states, including the influence of ambient bubble clouds, rain and sea spray under high winds is sorted acoustically, and shows promise for identifying and quantifying such conditions from underwater sound measurements. Long-term data are used to derive sound budgets showing the percent occurrence of dominant sound sources (ships, marine mammals, wind and rain), their relative loudness as a function of frequency, and statistical summaries of the retrieved rainfall amounts and wind speeds at the two buoy locations.

- **(H11)** Kalogiros, J., **M. N. Anagnostou**, E. N. Anagnostou, M. Montopoli, E. Picciotti, and F. S. Marzano, 2014: "Evaluation of a new Polarimetric Algorithm for Rain-Path Attenuation Correction of X-Band Radar Observations Against Disdrometer," IEEE Transactions on Geoscience and Remote Sensing, vol. 52, pp. 1369 – 1380.

A new algorithm called self-consistent with optimal parameterization (SCOP) for attenuation correction of radar reflectivities at low elevation angles is developed and evaluated. The SCOP algorithm, which uses optimal parameterization and best-fitted functions of specific attenuation coefficients and backscattering differential phase shift, is applied to X-band dual-polarization radar data and evaluated on the basis of radar observables calculated from disdrometer data at a distance of 35 km from the radar. The performance of the SCOP algorithm is compared with other algorithms [reflectivity-differential phase shift (ZPHI) and full self-consistent] presented in the literature. Overall, the new algorithm performs similarly to ZPHI for the attenuation correction of horizontal-polarization reflectivity, whereas the FSC algorithm exhibits significant underestimation. The ZPHI algorithm tends to overestimate small rain-path attenuation values. All algorithms exhibit significant underestimation at high differential rain-path attenuation values, probably due to the presence of hail along the path of the radar beam during the examined cases. The new SCOP algorithm has the potential to retrieve profiles of horizontal and differential reflectivities with better accuracy than the other algorithms due to the low error of the parameterization functions used in it. Typical radar calibration biases and measurement noise are sufficient requirements to ensure low errors of the proposed algorithm. A real-time method to calibrate the differential reflectivity without additional measurements is also described.

- **(H12)** Picciotti, E., F. S. Marzano, E. N. Anagnostou, J. Kalogiros, Y. Fessas, A. Volpi, V. Cazac, R. Pace, G. Cinque, L. Bernardini, K. De Sanctis, S. Di Fabio, M. Montopoli, **M. N. Anagnostou**, A. Telleschi, E. Dimitriou, and J. Stella, 2013: "Coupling X-band dual-polarized mini-radars and hydrometeorological forecast models: the HYDRORAD project", Nat. Hazards Earth Syst. Sci., vol. 13, pp. 1229 – 1241.

Hydro-meteorological hazards like convective outbreaks leading to torrential rain and floods are among the most critical environmental issues world-wide. In that context weather radar observations have proven to be very useful in providing information on the spatial distribution of rainfall that can support early warning of floods. However, quantitative precipitation estimation by radar is subjected to many limitations and uncertainties. The use of dual-polarization at high frequency (i.e. X-band) has proven particularly useful for mitigating some of the limitation of operational systems, by exploiting the benefit of easiness to transport and deploy and the high spatial and temporal resolution achievable at small antenna sizes. New developments on X-band dual-polarization technology in recent years have received the interest of scientific and operational communities in these systems. New enterprises are focusing on the advancement of cost-efficient mini-radar network technology, based on high frequency (mainly X-band) and low-power weather radar systems for weather monitoring and hydro-meteorological forecasting. Within the above context, the main objective of the HYDRORAD project was the development of an innovative integrated decision support tool for weather monitoring and hydro-meteorological applications. The integrated system tool is based on a polarimetric X-band mini-radar network which is the core of the decision support tool, a novel radar products generator and a hydro-meteorological forecast modelling system that ingests mini-radar rainfall products to forecast precipitation and floods. The radar products generator includes algorithms for attenuation correction, hydrometeor classification, a vertical profile reflectivity correction, a new polarimetric rainfall estimators developed for mini-radar observations, and short-term nowcasting of convective cells. The hydrometeorological modelling system includes the Mesoscale Model 5 (MM5) and the Army Corps of Engineers Hydrologic Engineering Center hydrologic and hydraulic modelling chain. The characteristics of this tool make it ideal to support flood monitoring and forecasting within urban environment and small-scale basins. Preliminary results, carried out during a field

© Ευρωπαϊκή Ένωση, 2002-2013 | http://europass.cedefop.europa.eu

campaign in Moldova, showed that the mini-radar based hydro-meteorological forecasting system can constitute a suitable solution for local flood warning and civil flood protection applications.

- **(H13)** Kalogiros, J., **M. N. Anagnostou**, E. N. Anagnostou, M. Montopoli, E. Picciotti, and F. S. Marzano, 2013: "Optimum Estimation of Rain Microphysical Parameters from X-band Dual-Polarization Radar Observables", IEEE Transactions on Geosc. And Remote. Sens., vol. 52, pp. 3063 – 3076.

Modern polarimetric weather radars typically provide reflectivity, differential reflectivity, and specific differential phase shift, which are used in algorithms to estimate the parameters of the rain drop size distribution (DSD), the mean drop shape, and rainfall rate. A new method is presented to minimize the parameterization error using the Rayleigh scattering limit relations multiplied with a rational polynomial function of reflectivity-weighted raindrop diameter to approximate the Mie character of scattering. A statistical relation between the shape parameter of the DSD with the median volume diameter of raindrops is derived by exploiting long-term disdrometer observations. On the basis of this relation, new optimal estimators of rain microphysical parameters and rainfall rate are developed for a wide range of rain DSDs and air temperatures using X-band scattering simulations of polarimetric radar observables. Parameterizations of radar specific path attenuation and backscattering phase shift are also developed, which do not depend on this relation. The methodology can, in principle, be applied to other weather radar frequencies. A numerical sensitivity analysis shows that calibration bias and measurement noise in radar measurements are critical factors for the total error in parameters estimation, despite the low parameterization error (less than 5%). However, for the usual errors of radar calibration and measurement noise (of the order of 1 dB, 0.2 dB, and 0.3 deg km^{-1} for reflectivity, differential reflectivity, and specific differential propagation phase shift, respectively), the new parameterizations provide a reliable estimation of rain parameters (typically less than 20% error).

- **(H14)** Kalogiros, J., **M. N. Anagnostou**, E. N. Anagnostou, Mario Montopoli, Errico Picciotti, and F. S. Marzano, 2013: "Correction of Polarimetric Radar Reflectivity Measurements and Rainfall Estimates for Apparent Vertical Profile in Stratiform Rain", J. Appl. Meteor. Climatol. vol. 52, pp. 1170 – 1186.

A method for correcting the vertical profile of reflectivity measurements and rainfall estimates (VPR) in plan position indicator (PPI) scans of polarimetric weather radars in the melting layer and the snow layer during stratiform rain is presented. The method for the detection of the boundaries of the melting layer is based on the well-established characteristic of local minimum of copolar correlation coefficient in the melting layer. This method is applied to PPI scans instead of a beam-by-beam basis with the addition of new acceptance criteria adapted to the radar used in this study. An apparent vertical profile of reflectivity measurements, or rainfall estimate, is calculated by averaging the range profiles from all of the available azimuth directions in each PPI scan. The height of each profile is properly scaled with melting-layer boundaries, and the reflectivity, or rainfall estimate, is normalized with respect to its value at the lower boundary of the melting layer. This approach allows variations of the melting-layer boundaries in space and time and variations of the shape of the apparent VPR in time. The application of the VPR correction to reflectivity and rainfall estimates from a reflectivity–rainfall algorithm and a polarimetric algorithm showed that this VPR correction method effectively removes the bias that is due to the brightband effect in PPI scans. It performs also satisfactorily in the snow region, removing the decrease of the observed VPR with range but with an overestimation by 2 dB or more. This method does not require a tuning using climatological data, and it can be applied on any algorithm for rainfall estimation.

- **(H15) Anagnostou, M. N.**, John Kalogiros, Frank S. Marzano, Emmanouil N. Anagnostou, Mario Montopoli, and Errico Picciotti, 2013: "Performance evaluation of a new dual-polarization microphysical algorithm based on long-term X band radar and disdrometer observations," Journal of Hydrometeor., vol. 14, pp. 560 – 576.

Accurate estimation of precipitation at high spatial and temporal resolution of weather radars is an open problem in hydrometeorological applications. The use of dual polarization gives the advantage of multiparameter measurements using orthogonal polarization states. These measurements carry significant information, useful for estimating rain-path signal attenuation, drop size distribution (DSD), and rainfall rate. This study evaluates a new self-consistent with optimal parameterization attenuation correction and rain microphysics estimation algorithm (named SCOP-ME). Long-term X-band dual-polarization measurements and disdrometer DSD parameter data, acquired in Athens, Greece, have been used to quantitatively and qualitatively compare SCOP-ME retrievals of median volume diameter D_0 and intercept parameter N_W with two existing rain microphysical estimation algorithms and the SCOP-ME retrievals of rain rate with three available radar rainfall estimation algorithms. Error statistics for rain rate estimation, in terms of relative mean and root-mean-square error and efficiency, show that the SCOP-ME has low relative error if compared to the other three methods, which systematically underestimate rainfall. The SCOP-ME rain microphysics algorithm also shows a lower relative error statistic when compared to the other two microphysical algorithms. However, measurement noise or other signal degradation effects can significantly affect the estimation of the DSD intercept parameter from the three different algorithms used in this study. Rainfall rate estimates with SCOP-ME mostly depend on the median volume diameter, which is estimated much more efficiently than the intercept parameter. Comparisons based on the long-term dataset are relatively insensitive to path integrated attenuation variability and rainfall rates, providing relatively accurate retrievals of the DSD parameters when compared to the other two algorithms.

- **(H16)** Cazac, V., J. Kalogiros, **M. N. Anagnostou**, F. S. Marzano, J. Stella, E. N. Anagnostou, Picciotti, E., G. Cinque, M. Montopoli, L. Bernardini, A. Volpi, and A. Telleschi, 2012: "Using Mini-Radar Network for Flood Forecasting in Moldova: HydroRad Project," Academos, nr. I. (24), pp. 90 – 96.

Rainfall estimates based on classical weather radar observations have quantitative limitations mainly due to the lack of uniqueness in the relationship of the single radar measurable (reflectivity) to the associated rainfall intensity. The polarization diversity capability of modern weather radars is expected to moderate this effect. High-frequency/low-power polarization-diversity mini-radars can constitute a low-cost solution to the problem of hydrologic forecasting for urban and small-scale fl ood-prone basins and coastal areas not well covered by operational weather radar networks. Thus, short-wavelength radar systems (like X-band radars) became more attractive also for research purposes and they can either be mobile (trailer mounted, containerized or airborne) or static. Their limitations are the smaller range due to low power and the significant signal attenuation at X-band in heavy rain, which must be corrected because it introduces errors in the rainfall estimation. The main objective of the HydroRad project was to develop an innovative dual-polarization X-band mini-radar system and software support tools for the use of weather and hydrologic applications. The overall system was tested in an experimental campaign where three mini-radar data and hydrometeorological tool was tested against a state-of the-art radar (XPol) and in-situ weather stations (raingauges and disdrometer) measurements. The data were subsequently integrated to simulate the flood response for Bic basin.

- **(H17)** Tsabaris, C., **M. N. Anagnostou**, D. L. Patiris, J. A. Nystuen, G. Eleftheriou, Th. Dakladas, V. Papadopoulos, A. Prospathopoulos, A. Papadopoulos and E. N. Anagnostou, 2011: "A marine groundwater spring in Stoupa, Greece: Shallow water instrumentation comparing radon and ambient sound with discharge rate", Procedia Earth and Planetary Science, vol. 4, pp. 3 – 9.

This work describes the combination of two autonomous in-situ systems, one using the measurements of radon progenies and a second using underwater ambient sound, for monitoring submarine groundwater discharge (SGD). The sensors were co-located on a platform and deployed in a SGD point source at Stoupa, Messenia, Greece. Long-term monitoring of radon progenies concentration as well as acoustic measurements are presented. The radon progeny data was correlated with the flow rate during one of the deployments. The ambient sound levels apparently responded to changes in the physical structure of the spring, but not in a predictable manner. The measuring platform can be easily applied to oceanographic survey activities, such as monitoring of gases and fluxes on submarine groundwater discharges, pockmarks, volcanoes, submarine faults, as well as to the measurement of rainfall freshwater flux at the ocean surface.

- **(H18) Anagnostou, M. N.**, J. A. Nystuen, E. N. Anagnostou, A. Papadopoulos, and V. Lykousis, 2011: "Passive aquatic listener (PAL): an adoptive underwater acoustic recording system for the marine environment", Nuclear Instruments and Methods in Physics Research Section A., vol. 626, pp. 94 – 98.

The ambient sound field in the ocean is a combination of natural and manmade sounds. Consequently, the interpretation of the ambient sound field can be used to quantify these processes. In the frequency range from 1 to 50 kHz, the general character of ocean ambient sound is a slowly changing background that is closely associated with local wind speed, interspersed with shorter time scale events such as rain storms, ships and animal calls. At lower frequencies the underwater ambient sound budget includes geologically generated sound activities including underwater volcanic eruptions, seismic and seepage faults that generate bubbles, etc. that can also potentially be classified and quantified. Acoustic data are collected on hydrophones. Hydrophones are simple, robust sensors that can be deployed on most ocean instrumentation systems including surface or sub-surface moorings, bottom mounted systems, drifters, ARGO floats or autonomous underwater platforms. A dedicated oceanic underwater recorder called a passive acoustic listener (PAL) has been developed. A principal issue is to accurately distinguish different sound sources so that they can be quantified as part of a sound budget, and then quantified if appropriate. Based on ongoing data collected from the Poseidon II network the retrieval potential of multi-parameters from underwater sound, including meteorological (i.e., precipitation and winds) and in general geophysical, anthropogenetic (i.e., ships, submarines, etc.) and biological (whales, etc.) sources is presented.

- **(H19) Anagnostou, M. N.**, J. Kalogiros, E. N. Anagnostou, M. Tarolli, A. Papadopoulos, and M. Borga, 2010: "Performance evaluation of high-resolution rainfall estimation by X-band dual-polarization radar for flash flood applications in mountainous basin", J. Hydrology, vol. 394, pp. 4 – 16.

Different relations between surface rainfall rate, R, and high-resolution polarimetric X-band radar observations were evaluated using a dense network of rain gauge measurements over complex terrain in Central Italian Alps. The specific differential phase shift, K_{DP}, rainfall algorithm (R_{KDP}) although associated with low systematic error it exhibits low sensitivity to the spatial variability of rainfall as compared to the standard algorithm (R_{STD}) that is based on the reflectivity-to-rainfall (Z–R) relationship. On the other hand, the dependence of the reflectivity measurement on the absolute radar calibration and the rain-path radar signal attenuation introduces significant systematic error on the R_{STD} rainfall estimates. The study shows that adjusting the Z–R relationship for mean-field bias determined using the R_{KDP} estimates as reference is the best technique for acquiring unbiased radar-rainfall estimates at fine space–time scales. Overall, the bias of the R_{KDP}-adjusted Z–R estimator is shown to be lower than 10% for both storm cases, while the relative root-mean-square error is shown to range from 0.6 (convective storm) to 0.9 (stratiform storm). A vertical rainfall profile correction (VPR) technique is tested in this study for the stratiform storm case. The method is based on a newly developed VPR algorithm that uses the X-band polarimetric information to identify the properties of the melting layer and devices a precipitation profile that varies for each radar volume scan to correct the radar-rainfall estimates. Overall, when accounting for the VPR effect there is up to 70% reduction in the systematic error of the 3^o elevation estimates, while the reduction in terms of relative root-mean-square error is limited to within 10%.

- **(H20) Anagnostou, M. N.**, J. Kalogiros, E. N. Anagnostou, and A. Papadopoulos, 2009: "Experimental results on rainfall estimation in complex terrain with a mobile X-band polarimetric radar," Atmospheric Research, Elsevier Ed., vol. 94, pp. 579 – 595.

In this work the capability of reliable rainfall measurements with small weather radars in complex terrain for flood forecasting purposes is examined. Rain measurements were carried out during winter–spring 2007 with a mobile X-band dual-polarization radar in the northwestern mountainous part of the island of Crete in Greece. In this area a 2D-video disdrometer and a network of raingauges was installed for radar calibration and evaluation of rainfall measurements, respectively. The complex terrain of the experimental site may significantly reduce the performance of rain measurements due to ground clutter and partial or total beam blockage. A beam blockage algorithm using high resolution terrain data was applied in order to find areas with significant terrain effects and estimate correction of the radar measurements. Rain attenuation correction was based on modern sophisticated algorithms using differential phase measurements. The accuracy of rainfall estimation from standard or polarimetric algorithms at plan position indicator (PPI) scans was examined for high-temporal resolution (1 min) rainfall rates and accumulated rainfall values for winter and spring time rain events. For high elevation measurements, which were required in order to avoid terrain effects in large areas of interest, a correction for the vertical-profile-of-reflectivity (VPR) was also applied to the radar data. An average VPR model used in the corresponding correction of reflectivity was constructed based on range–height indicator (RHI) scans. It was concluded that quantitative high resolution X-band radar observations of rainfall in complex terrain is possible after careful application of all the above processing steps.

- **(H21)** Tsabaris, C., **M. N. Anagnostou**, and S. Alexakis, 2009: "Instrumentation for Radon and Acoustic detection in seawater: design and application of a platform for rainfall monitoring using in-situ autonomous sensors: radon monitor and hydrophone," Sea Technology Magazine, vol. 50, pp. 10 – 13.
- **(H22)** Montopoli, M., F. S. Marzano, G. Vulpiani, **M. N. Anagnostou**, and E. N. Anagnostou, 2008: "Statistical Characterization and Modeling of Raindrop Spectra Time Series for Different Climatological Regions," IEEE Transaction of Geosciences and Remote Sensing, vol. 10, pp. 2778 – 2787.

A large data set of raindrop size distribution (RSD) measurements collected with the Joss–Waldvogel disdrometer (JWD) and the 2-D video disdrometer (2DVD) in the U.K., Greece, Japan, and the U.S. are analyzed and modelled. This work extends a previous effort devoted to the exploitation of U.K. data and the design of a stochastic procedure to randomly generate synthetic RSD intermittent time series. This study seeks to: 1) explore the differences of RSD-derived moments for distinct hydroclimate regions, ranging from tropics to subtropics and mid and northern latitudes; 2) compare the governing parameters of the normalized gamma RSD for both stratiform and convective events and perform a sensitivity analysis by using different best fitting techniques; 3) exploit the time-correlation structure of the estimated RSD parameters as the input of a vector autoregressive stationary model used to simulate time series (or horizontal profiles) of RSDs and, consequently, its moments as the rain rate and concentration; and 4) characterize the distribution of the inter-rain duration and rain duration to design a semi-Markov chain to represent the intermittency feature of the rainfall process in a climatological framework. This climatological analysis and the related stochastic RSD generation model may find useful applications within both hydrometeorology and radio propagation.

- **(H23)** Nystuen, J. A., E. Amitai, E. N. Anagnostou, and **M. N. Anagnostou**, 2008: "Spatial averaging of oceanic rainfall variability using underwater sound: Ionian Sea rainfall experiment 2004," J. Acoust. Soc. Am., vol. 123, pp. 1952 – 1962.

An experiment to evaluate the inherent spatial averaging of the underwater acoustic signal from rainfall was conducted in the winter of 2004 in the Ionian Sea southwest of Greece. A mooring with four passive aquatic listeners (PALs) at 60, 200, 1000, and 2000 m was deployed at 36.85°N, 21.52°E, 17 km west of a dual-polarization X-band coastal radar at Methoni, Greece. The acoustic signal is classified into wind, rain, shipping, and whale categories. It is similar at all depths and rainfall is detected at all depths. A signal that is consistent with the clicking of deep-diving beaked whales is present 2% of the time, although there was no visual confirmation of whale presence. Co-detection of rainfall with the radar verifies that the acoustic detection of rainfall is excellent. Once detection is made, the correlation between acoustic and radar rainfall rates is high. Spatial averaging of the radar rainfall rates in concentric circles over the mooring verifies the larger inherent spatial averaging of the rainfall signal with recording depth. For the PAL at 2000 m, the maximum correlation was at 3–4 km, suggesting a listening area for the acoustic rainfall measurement of roughly 30–50 km^2.

- **(H24) Anagnostou, M. N.**, J. A. Nystuen, E. N. Anagnostou, E. Nikolopoulos, and E. Amitai, 2008: "Evaluation of underwater rainfall measurements during the Ionian Sea rainfall experiment," IEEE Transaction of Geosciences and Remote Sensing, vol. 46, pp. 2936 – 2946.

Rainfall on the sea surface generates a loud and distinctive sound underwater. This sound propagates downward and attenuates, producing an effective listening area or an equivalent "catchment basin" for a listening device that is a function of depth and frequency. Acoustical measurements of rainfall are reported from four passive aquatic listeners (PALs) at 60-, 200-, 1000-, and 2000-m depths from a mooring in the Ionian Sea off the southwestern coast of Greece (37N, 21.5E) from January to April 2004. These measurements are compared to collocated high-resolution X-band dual-polarization (XPOL) radar rainfall measurements. The XPOL radar reports the spatial distribution of rainfall variability over the listening areas of the PALs. Four quality-controlled rainfall events, including drizzle, squall line, and heavy rainfall, are presented in this study. The radar rainfall is spatially averaged over the mooring and compared with the four different acoustic measurements at different depths. To understand the issue of spatial averaging, quantitative comparisons are presented, showing a high correlation between the acoustic measurements and the area-averaged radar estimates at corresponding resolutions.

- **(H25) Anagnostou, M. N.**, E. N. Anagnostou, V. Gianfranco, M. Montopoli, F. S. Marzano, and J. Vivekananda, 2008: "Evaluation of X-band polarimetric radar estimates of drop size distribution from coincident S-band polarimetric estimates and measured raindrop spectra," IEEE Transaction of Geosciences and Remote Sensing, vol. 46, pp. 3067 – 307.

Recent research has demonstrated the value of polarimetric measurements for the correction of rain-path attenuation at X-band radar frequency and the estimation of rain parameters including drop-size distributions (DSD). The issue this paper is concerned with is to what degree uncertainties in attenuation correction can affect the estimation of DSD. Since attenuation-correction uncertainty enhances with rain path, our hypothesis is that DSD retrieval uncertainty at X-band may deteriorate with range. In this paper, we evaluate the relative accuracy of X-band DSD retrieval against DSD estimates from S-band radar observations and in situ disdrometer spectra. We present comparisons of various techniques for estimating DSD model parameters from attenuation-corrected X-band dual-polarization radar data. Coincident X-band polarimetric-radar (XPOL) and S-band polarimetric-radar dual-polarized radar measurements from the International H_2O Project experiment as well as coincident XPOL (MP-X) measurements over disdrometer during a typhoon storm case in Japan are used to assess the accuracy of the different DSD retrieval algorithms applied to X-band radar measurements.

- **(H26) Anagnostou, M. N.**, E. N. Anagnostou, and J. Vivekananda, 2008: "Comparison of Raindrop Size

Distribution Estimates from X-Band and S-Band Polarimetric Observations," IEEE Geosciences and Remote Sensing Letters, vol. 4, pp. 601 – 605.

In this study the authors evaluate two algorithms, the so-called beta (β) and constrained methods, proposed for retrieving the governing parameters of the "normalized" gamma drop size distribution (DSD) from dual-polarization radar measurements. The β method treats the drop axis ratio as a variable and computes drop shape and DSD parameters from radar reflectivity (Z_H), differential reflectivity (Z_{DR}), and specific differential phase shift (K_{DP}). The constrained method assumes that the axis-ratio relation is fixed and computes DSD parameters from Z_H, Z_{DR}, and an empirical relation between the DSD slope and shape parameters. The two techniques are evaluated for polarimetric X-band radar observations by comparing retrieved DSD parameters with disdrometer observations and examining simulated radar parameters for consistency. Error effects on the β method and constrained method retrievals are analyzed. The β approach is found to be sensitive to errors in K_{DP} and to be less consistent with observations. Large retrieved β values are found to be associated with large retrieved DSD shape parameters and small median drop diameters. The constrained method provides reasonable rain DSD retrievals that agree better with disdrometer observations.

- **(H27) Anagnostou, M. N.**, E. N. Anagnostou, J. Vivekananda, and Fred L. Ogden, 2007: "Comparison of Two Raindrop Size Distribution Retrieval Algorithms for X-Band Dual Polarization Observations," Journal of Hydrometeorology, vol. 9, pp. 589 – 600.

This letter evaluates the consistency of rainfall drop size distribution (DSD) parameters that were estimated from attenuation-corrected X-band dual-polarization (XPOL) radar measurements with estimates from a collocated S-band dual-polarization radar (S-Pol). The DSD retrieval technique uses reflectivity and differential reflectivity, and a constrained relationship to estimate the three parameters of a "normalized" gamma distribution model. The more definitive S-Pol DSD parameter estimates are used as a reference to assess the performance of the corresponding XPOL estimates for different rain-path attenuation values. Results show that XPOL attenuation-corrected profiles can provide rainfall DSD estimations that are consistent to an S-band dual-polarization radar, even in cases of moderate to high rain-path attenuation.

- **(H28)** Amitai, E., J. A. Nystuen, E. N. Anagnostou, and **M. N. Anagnostou**, 2007: "Comparison of deep underwater measurements and Radar observations of rainfall", IEEE Geosciences and Remote Sensing Letters, vol. 4, pp. 406 – 410.

Deep-water acoustical measurements of rainfall are compared to high-resolution ground radar observations for the first time. The measurements of underwater ambient sound were made from a subsurface mooring near Methoni, Greece, in 2004. The acoustical measurements were at 60-, 200-, 1000-, and 2000-m depths. Simultaneous ground-based polarimetric X-band radar observations were made over the acoustic mooring. Comparisons show acoustic detection of rain events and storm structure that are in agreement with the radar observations. Results from a comparison between the underwater sound pressure level at different depths and the observed radar reflectivities are presented.

- **(H29) Anagnostou, M. N.**, E. N. Anagnostou, and J. Vivekananda, 2006: "Correction for Rain-Path Specific and Differential Attenuation of X-band Dual-Polarization Observations," IEEE Transaction of Geosciences and Remote Sensing, vol. 44, pp. 2470 – 2480.

The accuracy of attenuation correction for X-band reflectivity (Z_H) and differential reflectivity (Z_{DR}) measurements in rainfall is analyzed using coincident X-band and S-band polarimetric radar observations collected during the International H_2O Project in the period of May–June 2002 at northwestern Oklahoma. Two distinct attenuation correction techniques that use the differential propagation phase shift (Φ_{DP}) information, which is not a power-dependent measurement, as a means to provide independent estimates of path-integrated attenuation are assessed. The study is facilitated by non-attenuated X-band Z_H and Z_{DR} profiles simulated based on raindrop size distribution parameters retrieved from matched multiparameter (Z_H, Z_{DR}, and K_{DP}) S-band observations. The major outcome of this assessment is that Φ_{DP}-based attenuation correction for both techniques can reach almost unbiased measurements (within 5% mean relative error) and low random error (15–20% relative standard deviation). The study shows moderate differences in the error statistics of the evaluated techniques. The sensitivity of attenuation correction uncertainty with respect to the assumed variability in raindrops' oblateness–size relation and the noise in Φ_{DP} measurement is also shown.

- **(H30)** Defer E. and **M. N. Anagnostou**, 2006: "Characterization of the precipitation in Southwestern part of Greece with X-band Doppler radar, 2-D video disdrometer and rain gauges," Advances in Geosciences, vol. 7, pp. 121 – 125.

We document precipitation in the southwestern part of Greece with the National Observatory of Athens (NOA) X-band radar, NOA 2D video disdrometer and a network of rain gauges. The observations were collected between February and April 2004. Time evolution of the drop size distribution (DSD) is presented for the 9 March 2004 case where rain rate (computed on 1-min period) was measured up to 80 mm/h and reflectivity at the location of the disdrometer exceeded 40 dBZ. We then present the differences of DSD as function of the rain rate for the studied case as well as for the entire observations of the field experiment. It shows that higher the rain rate is, larger the range of the DSD and higher the concentration of the raindrops are.

- **(H31)** Anagnostou, E. N., M. Grecu, and **M. N. Anagnostou**, 2006: "X-band Polarimetric Radar Rainfall Measurements in Keys Area Microphysics Project," J. Atmos. Sci., Vol. 63, pp. 187 – 203.

The Keys Area Microphysics Project (KAMP), conducted as part of NASA's Fourth Convective and Moisture Experiment (CAMEX-4) in the lower Keys area, deployed a number of ground radars and four arrays of rain gauge and disdrometer clusters. Among the various instruments is an X-band dual-polarization Doppler radar on wheels (XPOL), contributed by the University of Connecticut. XPOL was used to retrieve rainfall rate and raindrop size distribution (DSD) parameters to be used in support of KAMP science objectives. This paper presents the XPOL measurements in KAMP and the algorithm developed for attenuation correction and estimation of DSD model parameters. XPOL observations include the horizontal polarization reflectivity Z_H, differential reflectivity Z_{DR}, and differential phase shift Φ_{DP}. Here, Z_H and Z_{DR} were determined to be positively biased by 3 and 0.3 dB, respectively. A technique was also applied to filter noise and correct for potential phase folding in Φ_{DP} profiles. The XPOL attenuation correction uses parameterizations that relate the path-integrated specific (differential) attenuation along a radar ray to the filtered-Φ_{DP} (specific attenuation) profile. Attenuation-corrected Z_H and specific differential phase shift (derived from filtered Φ_{DP} profiles) data are then used to derive two parameters of the normalized gamma DSD model, that is, intercept (N_W) and mean drop diameter (D_0). The third parameter (shape parameter μ) is calculated using a constrained μ–Λ relationship derived from the measured raindrop spectra. The XPOL attenuation correction is evaluated using coincidental no attenuated reflectivity fields from the Key West Weather Surveillance Radar-1988 Doppler (WSR-88D), while the DSD parameter retrievals are statistically assessed using DSD parameters calculated from the measured raindrop spectra. Statistics show that XPOL DSD parameter estimation is consistent with independent observations. XPOL estimates of water content and N_W are also shown to be consistent with corresponding retrievals from matched ER-2 Doppler radar (EDOP) profiling observations from the 19 September airborne campaign. Results shown in this paper strengthen the applicability of X-band dual-polarization high resolution observations in cloud modelling and precipitation remote sensing studies.

- **(H32) Anagnostou, M. N.**, Anagnostou, E. N., and Krajewski, W. F., 2004: “High-resolution rainfall rate and DSD estimation from X-band polarimetric radar measurements,” Bulletin of the American Meteorological Society, Vol., 1, pp. 599-608.
- **(H33)** Anagnostou, E. N., **M. N. Anagnostou**, W. F. Krajewski, A. Kruger, and B. Miriovsky, 2004: “High-Resolution Rainfall Estimation from X-Band Polarimetric Radar Measurements,” J. Hydrometeor., Vol. 5, pp. 110-128.

The paper presents a rainfall estimation technique based on algorithms that couple, along a radar ray, profiles of horizontal polarization reflectivity (Z_H), differential reflectivity (Z_{DR}), and differential propagation phase shift (FDP) from X-band polarimetric radar measurements. Based on in situ raindrop size distribution (DSD) data and using a three-parameter “normalized” gamma DSD model, relationships are derived that correct X-band reflectivity profiles for specific and differential attenuation, while simultaneously retrieving variations of the normalized intercept DSD parameter (N_W). The algorithm employs an iterative scheme to intrinsically account for raindrop oblateness variations from equilibrium condition. The study is facilitated from a field experiment conducted in the period October–November 2001 in Iowa City, Iowa, where observations from X-band dual-polarization mobile radar (XPOL) were collected simultaneously with high-resolution in situ disdrometer and rain-gauge rainfall measurements. The observed rainfall events ranged in intensity from moderate stratiform precipitation to high-intensity (>50 mm h^{-1}) convective rain cells. The XPOL measurements were tested for calibration, noise, and physical consistency using corresponding radar parameters derived from coincidentally measured raindrop spectra. Retrievals of N_W from the attenuation correction scheme are shown to be unbiased and consistent with N_W values calculated from independent raindrop spectra. The attenuation correction based only on profiles of reflectivity measurements is shown to diverge significantly from the corresponding polarimetric- based corrections. Several rain retrieval algorithms were investigated using matched pairs of instantaneous high-resolution XPOL observations with rain rates from 3-min-averaged raindrop spectra at close range (~5 km) and rain-gauge measurements from further ranges (~10 km). It is shown that combining along-a-ray (corrected Z_H, Z_{DR}, and specific differential phase shift) values gets the best performance in rainfall estimation with about 40% (53%) relative standard deviation in the radar–disdrometer (radar–gauge) differences. The case tuned reflectivity–rainfall rate (Z–R) relationship gives about 65% (73%) relative standard deviation for the same differences. The systematic error is shown to be low (~3% overestimation) and nearly independent of rainfall intensity for the multiparameter algorithm, while for the standard Z–R it varied from 10% underestimation to 3% overestimation.

Επιστημονικές Εκθέσεις

(H34) Nystuen, J. A., E. Amitai, E. N. Anagnostou, and **M. N. Anagnostou**, 2007: "Spatial averaging of oceanic rainfall variability using underwater sound. Ionian Sea Rainfall Experiment 2004: Acoustic component," APL-UW TR 0701.

Δημοσιεύσεις σε Βιβλία

(H35) Anagnostou, M. N. and E. N. Anagnostou, 2008: “Performance of Algorithms for Rainfall Retrieval from Dual-Polarization X-Band Radar Measurements”. Book Chapter in “Precipitation: Advances in measurement, estimation and prediction”, Editor: Dr. Michaelides C. Silas, pp. 313 – 340, Springer (DOI: 10.1007/978-3-540-77655-0).

(H36) Kalogiros, J., **M. N. Anagnostou**, F. S. Marzano, E. Picciotti, G. Cinque, M. Montopoli, L Bernardini, E. N. Anagnostou, A. Volpi, and A. Telleschi, 2012: “Mobile radar network measurements for flood applications during the field campaign of HydroRad project”. Book Chapter in “Advances in Meteorology, Climatology and Atmospheric Physics”, Editors: Profs. Helmis Costas, and Nastos T. Panagiotis, pp. 137 – 143, Springer (DOI: 10.1007/978-3-642-29172-2).

(H37) Anagnostou, M. N., J. Kalogiros, E. Nikolopoulos, Y. Derin, E. N. Anagnostou, and M. Borga, 2017: “Satellite Rainfall Error Analysis with the Use of High-Resolution X-Band Dual-Polarization Radar Observations over the Italian Alps”. Book Chapter in “Perspectives on Atmospheric Sciences”, Editors: Profs. Karakostas Theodore, Bais Alkiviadis, and Nastos T. Panagiotis, pp. 279 – 286, Springer (DOI: 10.1007/978-3-319-35095-0_39).

Συνέδρια (με πρακτικά ή χωρίς)

1. Derin, Y., E. N. Anagnostou, M. N. Anagnostou, J. A. Kalogiros, P-E Kirstteter, J. J. Gourley, and A. Berne, 2019: “ Analysis of X-Band Dual Polarization Radar Observations over Multiple Complex Terrain Regions”, 11th International Conference on Weather Radar and Hydrology, 19 – 22 Nanjing, China.

2. Derin, Y., E. N. Anagnostou, Md Abul E. Bhuiyan, M. N. Anagnostou, and J. A. Kalogiros, 2019: “Characterization and Modeling of Satellite-Based Precipitation Uncertainty over Complex Terrain”, AGU Fall Meeting, 9 – 13 December, New Orleans, USA.

3. Derin, Y., E. N. Anagnostou, M. N. Anagnostou, and J. A. Kalogiros, 2019: “Analysis of X-Band Dual Polarization Radar Observations over Multiple Complex Terrain Regions”, AGU Fall Meeting, 9 – 13 December, New Orleans, USA.

4. Anagnostou, M. N., Kalogiros J. A., C. Spyrou, G. Varlas, G. Papagelis, A. Retalis, A. Mentzafou, D. Katsanos, P. Katsafados, A. Papadopoulos, D. Chaskos, E. Houssos, C. Lolis, and A. Bartzokas, 2019: "A Low-Cost Multi-Platform System for Early Warning of Extreme Hydrometeorological Events", SafeCorfu 2019 – 6th International Conference on Civil Protection & New Technologies 6 – 9 November, Ionian Academy – Corfu, Greece.

5. Spyrou, C., G. Varlas, M. N. Anagnostou, A. Pappa, J. Kalogiros, A. Papadopoulos, M. M. Miglietta, A. Tiessi, and P. Katsafados, 2019: " Latest LAPS developments Assimilating remote sensing data and its impact on LAPS predictability," 3rd European Nowcasting Conference, 24 – 26 April, Madrid, Spain,

6. Varlas, G., A. Papadopoulos, V. M. Nomikou, E. Karymbalis, M. N. Anagnostou, and P. Katsafados, 2018: "Assessing the interaction between the atmospheric and hydrological environments in the drainage basin of Sperchios River", 14th International Conference on Meteorology, Climatology and Atmospheric Physics, October 15-17, Alexandroupolis, Greece

7. Anagnostou, M. N., Varlas, G., J. Kalogiros, P. Katsafados, A. Papadopoulos, E. Baltas, and E. Anagnostou, 2018: "A Hydrometeorological analysis of an extreme flash flood event in the Urban area of West Attica, Greece", in the proceedings of the 10th European Conference on Radar in Meteorology and Hydrology (ERAD2018), 1 – 6 July, Netherlands. (http://projects.knmi.nl/erad2018/ERAD2018_extended_abstract_243.pdf)

8. Anagnostou, M. N., D. Yagmur, J. Kalogiros, E. N. Anagnostou, "An Analysis of X-Band Polarimetric Radar Rainfall Observations from Various Complex Terrain" ", in the proceedings of the 10th European Conference on Radar in Meteorology and Hydrology (ERAD2018), 1 – 6 July, Netherlands.

9. Kalogiros, J., A. Retalis, D. Katsanos, E. Nikolopoulos, M. Diakakis, E. Andreadakis and M. N. Anagnostou, "An extreme flash flood event in Greece: Observations and atmospheric-hydrological modeling", 11th HyMeX Workshop, 29 May-2 June 2018, Lecce, Italy

10. Derin, Y., E. N. Anagnostou, M. N. Anagnostou, J. Kalogiros, D. Casella, A. C. Marra, G. Panegrossi, and P. Sanò, 2017: "Passive Microwave Precipitation Retrieval Uncertainty Characterized based on Field Campaign Data over Complex Terrain", AGU Fall Meeting, 11 – 15 December, New Orleans, USA.

11. Prospathopoulos, A., D. Kassis, M. N. Anagnostou, K. Pagou, and P. Panayotidis, 2017: "Monitoring Underwater Noise in Greek Waters: Key Issues in Implementing the EU Marine Strategy Framework Directive", UACE, 4 – 8 Sept., Skiathos, Greece.

12. Nikolopoulos, E. I., M. N. Anagnostou, E. N. Anagnostou, C. Albergel, E. N. Dutra, G. Fink, A. Martínez de la Torre, S. Munier, J. Polcher, and P. Quintana-Segui, 2016: "A Multi-Model/Multi-Forcing Investigation of Precipitation Uncertainty Propagation in Hydrologic Simulations", AGU Fall Meeting, 12 – 16 December, San Francisco, USA.

13. Derin, Y., E. N. Anagnostou, J. Kalogiros, M. N. Anagnostou, A. C. Marra, G. Panegrossi, V. Levizzani, E. Cattani, D. Casella, and P. Sanò, 2015: "Passive Microwave Rainfall Error Analysis using High-Resolution X-band Dual-Polarization Radar Observations in Complex Terrain,", AGU Fall Meeting, 14 – 18 December, San Francisco, USA.

14. Porcacchia, L., P.-E. Kirstetter, B.-L. Cheong, M. N. Anagnostou, V. Maggioni, J. J. Gourley, 2016: "Warm-rain Precipitation over Complex Regions: a New Polarimetric Classification Scheme", in proceedings of 9th European Conference on Radar in Meteorology and Hydrology, 10 – 14 October, Antalya, Turkey.

15. Porcacchia, L., P.-E. Kirstetter J. J. Gourley, M. N. Anagnostou, E. N. Anagnostou, B. Olivier, B.-L. Cheong, V. Maggioni, and Y. Hong, 2016: " X-band radar field campaign data analysis for orographic/warm-rain precipitation processes," EGU General Assembly,17 - 22 April, Vienna, Austria, id. EPSC2016-8573.

16. Anagnostou M. N., Kalogiros J., Nikolopoulos E., Derin Y., Anagnostou E. N., Borga M., 2016: "Satellite Rainfall Error Analysis with the use of High-Resolution X-band Dual-Polarization Radar Observations over the Italian Alps," 13th International Conference on Meteorology, Climatology and Atmospheric Physics COMECAP 2016, Thessaloniki, 19 – 21 September.

17. Anagnostou M. N., Pytharoulis I., Karavokiros G., Matsangouras I. T., Yagmur D., Makropoulos C., and Anagnostou E. N., 2016: "Using Numerical Weather Prediction (NWP) Model Realisations from Satellite Precipitation Observations for Flood Forecasting Uncertainty in Costal Urban Area," 13th International Conference on Meteorology, Climatology and Atmospheric Physics COMECAP 2016, Thessaloniki, 19 – 21 September.

18. Zuba, M., Anagnostou E. N., Nystuen J., and Anagnostou M. N., 2015: "UPAL: Underwater passive aquatic listener," in the proceedings of the MTS/IEEE OCEANS 2015, 19 – 22 October, Washington, USA.

19. Matsangouras, I. T., J. Kalogiros, P. T. Nastos, M. N. Anagnostou, I. Pytharoulis, and H. B. Bluestein, 2015: "X-band dual-polarization mobile Doppler radar close-range observations of tornado activities in urban area of Athens, Greece," 8th European Conference on Severe Storms – ECSS, 14 – 18 September, Wiener Neustadt, Austria.

20. Gourley, J. J., J. Kalogiros, E. N. Anagnostou, M. N. Anagnostou, O. Bousquet, and P. E. Kirstetter, 2015: "Rainfall rate and microphysics retrievals from mobile X-band polarimetric radars," 37th Conference on Radar Meteorology, American Meteorological Society, 14 – 18 September, Norman, OK, USA.

21. Anagnostou, M. N., E. I. Nikolopoulos, J. Kalogiros, E. N. Anagnostou, F. Marra, E. Mair, G. Bertoldi, U. Tappeiner, M. Borga, 2015: "Hydrological evaluation of X-band polarimetric radar rainfall estimation in the eastern Italian Alps," 9th HyMeX Workshop, 21 - 25 September, Mykonos Island, Greece.

22. Barbieri S., E. Picciotti, M. Montopoli., S. Di Fabio, R. Lidori, F. S. Marzano, J. Kalogiros, M. N. Anagnostou, and L. Baldini, 2015: "Performance evaluation of rain products from a polarimetric X - band radar by using a new raw data processing chain," in the proceedings of the IEEE International Geoscience and Remote Sensing Symposium, IGARSS 2015, 26 – 31 July, Milan, Italy.

23. Derin Y., E. N. Anagnostou, J. Kalogiros, and M. N. Anagnostou, 2015: "Passive Microwave Rainfall Error

Analysis using High-Resolution X-band Dual-Polarization Radar Observations in Complex Terrain," EGU General Assembly, Geophysical research abstracts, Vienna, Austria, 12 – 17 April.

24. Erlingis, J.M., J.J. Gourley, P. Kirstetter, E.N. Anagnostou, J.A. Kalogiros, and M.N. Anagnostou, 2015: "Performance of Precipitation Algorithms During IPHEx and Observations of Microphysical Characteristics in Complex Terrain," American Geophysical Union, Fall Meeting 2015, abstract id. H12E-05.

25. Kalogiros, J. A., M. N. Anagnostou, E. I. Nikolopoulos, E. N. Anagnostou, M. Borga, G. Delrieu, B. Boudevillain, F. Marra, E. Mair, G. Bertoldi, U. Tappeiner, 2014: "High resolution polarimetric radar observations in North-East Italian Alps and Southern France during HyMeX SOP 2012 and 2013", 8th HyMeX workshop 15 – 18 September, La Valletta, Malta.

26. Anagnostou M. N., E. I. Nikolopoulos, J. Kalogiros, E. N. Anagnostou, F. Marra, M. Borga, E. Mair, G. Bertoldi, U. Tappeiner, 2014: "High-resolution X-band polarimetric radar Observations during the HyMeX 2012 Special Observation Period in North-East Italian Alpine Region: Evaluating hydrologic impacts," 8th European Conference on Radar in Meteorology and Hydrology, 1 – 5 September, Garmisch-Partenkirchen, Germany.

27. Anagnostou, M. N., J. Kalogiros, E. I. Nikolopoulos, E. N. Anagnostou, F. Marra, M. Borga, E. Mair, G. Bertolidi, and U. Tappeiner, 2014: "Dual-Polarization X-band Mobile Radar Observations as a Hydrologic Support Tool during the HyMeX Special Observation Period in North-East Italian Alpine Region," 12th International Conference on Meteorology, Climatology and Atmospheric Physics COMECAP 2014, Heraklion, Crete, 28 – 31 May.

28. Anagnostou, M. N., John Kalogiros, Frank S. Marzano, Emmanouil N. Anagnostou, Luca Baldini, Efthymios Nikolopoulos, Mario Montopoli, and Errico Picciotti, 2014: "Evaluating the potential use of a high-resolution X-band polarimetric radar observations in Urban Hydrology," EGU General Assembly, Geophysical research abstracts, Vol. 15, Vienna, Austria, 27 April – 02 May.

29. Nikolopoulos, E. I., M. N. Anagnostou, J. Kalogiros, E. N. Anagnostou, F. Marra, E. Mair, G. Bertolidi, U. Tappeiner, and M. Borga, 2014: "X-band dual-polarization radar observations as a hydrologic supporting tool in the North East Alpine region," International Weather Radar and Hydrology Symposium, Washington, USA, 7 – 9 April.

30. Anagnostou, M. N., J. Kalogiros, E. I. Nikolopoulos, E. N. Anagnostou, F. Marra, E. Mair, G. Bertolidi, U. Tappeiner, and M. Borga, 2013: "Evaluating the potential of mobile X-band Dual- Polarization Radar Observations in Mountainous Hydrology," the 6th International Workshop for GPM Ground Validation, Rome, Italy, 5 – 7 November.

31. Pensieri, S., R. Bozzano, M. N. Anagnostou, E. N. Anagnostou, R. Bechini, and J. A. Nystuen, 2013: "Monitoring the Oceanic Environment Through Passive Underwater Acoustics," in the proceedings of MTS IEEE OCEANS 13, Bergen, Norway, June 10 – 13.

32. Anagnostou M. N., J. Kalogiros, E. Nikolopoulos, E. N. Anagnostou, F. Marra, E. Mair, G. Bertolidi, U Tappeiner, and M. Borga, 2013: "Evaluating the potential of X-band polarimetric radar observations in mountainous hydrology," EGU General Assembly, Geophysical research abstracts, Vol. 15, Vienna, Austria, 7 – 12 April.

33. Anagnostou, M. N., S. Pensieri, E. N. Anagnostou, R. Bozzano, R. Bechini, and J. A. Nystuen, 2013: "Underwater acoustic evidences of the 2011 autumnal floods in the Ligurian region. EGU General Assembly," Geophysical research abstracts, Vol. 15, Vienna, Austria, 7 – 12 April.

34. Anagnostou, M. N., John Kalogiros, Joël Van Baelen, Emmanouil N. Anagnostou, Mario Montopoli, Frank S. Marzano, and Anastasios Papadopoulos, 2012: "Comparison of rainfall microphysics estimates from a dual-polarization X-band radar with a 2D video disdrometer, a Parsivel disdrometer and a k band Micro Rain Radar," in the proceedings of ERAD 2012 – the 7th European Conference on Radar in Meteorology and Hydrology, Toulouse, France, 25 – 29 June.

35. Kalogiros, J., M. N. Anagnostou, F. S. Marzano, E. Picciotti, G. Cinque, M. Montopoli, L Bernardini, E. N. Anagnostou, A. Volpi, and A. Telleschi, 2012: "Mobile radar network measurements for flood applications during the field campaign of HydroRad project," in the proceedings of 11th International Conference on Meteorology, Climatology and Atmospheric Physics COMECAP 2012, Athens, 29 May – 1 June.

36. Anagnostou, M. N., J. Kalogiros, J. V. Baelen, F. S. Marzano, J. A. Nystuen, M. Montopoli, E. N. Anagnostou, and E. Picciotti, 2011: "Advancing Hydrometeorological use of Multi-Instruments for Experimental Investigation of Precipitation Structure, Dynamics and Microphysics in Eastern Mediterranean: HYDREX". 13th Plinius Conference on Mediterranean Storms, Vol. 13, Plinius13 – 55, Savona, Italy, 7 – 9 September.

37. Tsabaris, C., Anagnostou M. N., Patiris D. L., Nystuen J. A., Eleftheriou G., Dakladas Th., Papadopoulos V., Prospathopoulos A., Papadopoulos A., and Anagnostou E. N., 2011: "A marine groundwater spring in Stoupa, Greece: Shallow water instrumentation comparing radon and ambient sound with discharge rate," in the proceedings of the 2nd International Workshop on Research in Shallow Marine and Fresh Water Systems, 3 – 10 October, Milazzo, Italy;

38. Anagnostou, M. N., J. Kalogiros, E. N. Anagnostou, A. Papadopoulos, F. Marzano, M. Montopoli, and E. Picciotti, 2010: "Performance comparison of dual-polarization X-band path attenuation and rainfall microphysical estimates with measured disdrometer raindrop spectra," in the proceedings of the 6th European Conference on Radar in Meteorology and Hydrology, Sibiu, Romania, 6 – 10 September.

39. Nystuen, J., M. N. Anagnostou, E. N. Anagnostou, A. Papadopoulos, 2010: "Real-time Measurements of Physical Conditions at the Sea Surface Using Passive Underwater Sound," European Conference of Underwater Acoustics, Istanbul, Turkey, 5 – 9 July.

40. Kalogiros, J., Anagnostou, M. N., E. N. Anagnostou, A. Papadopoulos, F. Marzano, M. Montopoli, and E. Picciotti, 2010: "Optimized algorithms for estimation of rainfall rate and microphysical rain parameters from radar observables," 10th International Precipitation Conference, Coimbra, Portugal, 23 – 25 June.

41. Anagnostou, M. N., J. Kalogiros, E. N. Anagnostou, A. Papadopoulos, F. Marzano, M. Montopoli, and E. Picciotti, 2010: "Advances in high-resolution X-band dual-polarization rainfall and drop-size distribution estimation,"

10th International Precipitation Conference, Coimbra, Portugal, 23 – 25 June.

42. Nystuen, J., E. N. Anagnostou, M. N. Anagnostou, E. Amitai, A. Papadopoulos, and S. A. Riser, 2010: "Underwater Acoustic Measurements of Precipitation: A Review and New Applications," 10th International Precipitation Conference, Coimbra, Portugal, 23 – 25 June.

43. Anagnostou, M. N., J. Nystuen, J. Kalogiros, G. Potiriadis, E. N. Anagnostou, G. Alexakis, A. Papadopoulos, D. Ballas, K. Nittis, P. Pagonis, L. Perivoliotis, and D. Georgopoulos, 2010: "Evaluation of Underwater Acoustic Estimates through Comparison with Buoy Anemometer & Radar Measurements," in the proceedings of the 10th International Conference on Meteorology, Climatology and Atmospheric Physics, Patra, Greece, 25 – 28 May.

44. Anagnostou, M. N., J. A. Nystuen, E. N. Anagnostou, E. Amitai, and A. Papadopoulos, 2009: "Evaluation of underwater acoustic estimates of raindrop size distribution through comparison with Dual-polarized radar measurements," EGU General Assembly, European Geoscience Society, Vienna, Austria, 19 – 24 April.

45. Kalogiros, J., M. N. Anagnostou, E. N. Anagnostou, and A. Papadopoulos, 2009: "Statistical analysis of 2D-video disdrometer measurements and errors of polarimetric rainfall estimators," EGU General Assembly, European Geoscience Society, Vienna, Austria, 19 – 24 April.

46. Nikolopoulos, E., M. N. Anagnostou, E. N. Anagnostou, F. S. Marzano, and M. Borga, 2009: "The effect of storm type on satellite precipitation estimation error: results from an experiment in eastern Italian Alps," EUMETSAT Meteorological Satellite Conference, Darmstadt, Germany, 08 – 12 September.

47. Anagnostou, M. N., J. Kalogiros, M. Tarolli, E. N. Anagnostou, M. Borga, and A. Papadopoulos, 2009: "Rainfall measurements of weather radar in complex terrain," in the proceedings of the 5th European Conference on Radar in Meteorology and Hydrology, Helsinki, Finland.

48. Kalogiros J., M. N. Anagnostou, A. Papadopoulos, and E. N. Anagnostou, 2009: "Statistical analysis of video disdrometer measurements and errors of polarimetric rainfall estimators," in the proceedings of the 5th European Conference on Radar in Meteorology and Hydrology, Helsinki, Finland.

49. Marzano, F. S., D. Scaranari, M. Montopoli, G. Vulpiani, M. N. Anagnostou, and E. N. Anagnostou, 2009: "Hydrometeor classification and water content estimation from X-band dual-polarized radars: IHOP case study analysis," in the proceedings of the 5th European Conference on Radar in Meteorology and Hydrology, Helsinki, Finland.

50. Montopoli, M., F. S. Marzano, G. Botta, D. Scaranari, G. Vulpiani, M. N. Anagnostou, and E. N. Anagnostou, 2009: "Rain-rate advanced retrieval techniques for C-band and X-band polarimetric radars tuned by globally-distributed disdrometer based," in the proceedings of the 5th European Conference on Radar in Meteorology and Hydrology, Helsinki, Finland.

51. Anagnostou, M. N., M. Tarolli, J. Kalogiros, E. N. Anagnostou, A. Papadopoulos, M. Borga, and F. Zanon, 2009: "Performance of Rainfall Algorithms from Mobile X-band Dual-Polarization Radar over Complex Terrain: Result from the 2006-2007 Hydrate Project," EGU General Assembly, European Geoscience Society, Vienna, Austria.

52. Anagnostou, M. N., J. Nystuen, E. N. Anagnostou, E. Nikolopoulos, E. Amitai, and A. Papadopoulos, 2009: "Evaluation of Underwater Acoustic Estimates of Raindrop Size Distribution through Comparison with Dual-Polarization Radar Measurements," EGU General Assembly, European Geoscience Society, Vienna, Austria.

53. Anagnostou, M. N., J. A. Nystuen, E. N. Anagnostou, E. I. Nikolopoulos, and E. Amitai, 2008: "Evaluation of underwater rainfall measurements during the Ionia sea rainfall experiment," in the proceedings of the 9th conference on meteorology – climatology and atmospheric research, Thessaloniki, Greece.

54. Kalogiros, J., M. N. Anagnostou, and E. N. Anagnostou, 2008: "Rainfall measurements over complex terrain," in the proceedings of the 9th conference on meteorology – climatology and atmospheric research, Thessaloniki, Greece.

55. Anagnostou, M. N., J. A. Nystuen, E. N. Anagnostou, and E. I. Nikolopoulos, 2007: "Evaluation of underwater rainfall estimation through comparison with dual-polarization radar rainfall measurements in the Ionian Sea Rainfall Experiment," in the proceedings of the 9th Plinius Conference on Mediterranean Storms, European Geoscience Society, Varenna, Italy.

56. Anagnostou, M. N., J. Kalogiros, and E. N. Anagnostou, 2007: "Evaluation of quantitative rainfall estimation by X-band dual-polarization radar observations," in the proceedings of the 9th Plinius Conference on Mediterranean Storms, European Geoscience Society, Varenna, Italy.

57. Anagnostou, M. N., J. A. Nystuen, E. N. Anagnostou, E. I. Nikolopoulos, and E. Amitai, 2007: "Evaluation of Underwater Rainfall Measurements: Ionian Sea Rainfall Experiment 2004," in the proceedings of the IEEE International Geoscience and Remote Sensing Symposium (p2087), IEEE Geoscience and Remote Sensing Society, Barcelona, Spain.

58. Anagnostou, M. N., E. N. Anagnostou, G. Vulpiani, M. Montopoli, F. S. Marzano, and J. Vivekananda, 2007: "Evaluation of X-Band Polarimetric Radar Estimates of Drop Size Distributions From Coincident S-Band Polarimetric Estimates and Measured Raindrop Spectra," in the proceedings of the, IEEE International Geoscience and Remote Sensing Symposium (1539), IEEE Geoscience and Remote Sensing Society, Barcelona, Spain.

59. Montopoli, M., G. Vulpiani, M. N. Anagnostou, E. N. Anagnostou, and F. S. Marzano, 2007: "Processing Disdrometer Raindrop Spectra Timeseries From Various Climatologically Regions Using Estimation and Autoregressive Methods," in the proceedings of the IEEE International Geoscience and Remote Sensing Symposium (2099), IEEE Geoscience and Remote Sensing Society, Barcelona, Spain.

60. Marzano, F. S., D. Scaranari, M. Montopoli, G. Vulpiani, M. N. Anagnostou, and E. N. Anagnostou, 2007: "Bayesian Classification of Hydrometeors from Polarimetric Radars at S and X Band: Algorithm Design and

Experimental Comparisons," in the proceedings of the IEEE International Geoscience and Remote Sensing Symposium, IEEE Geoscience and Remote Sensing Society, Barcelona, Spain.

61. Kalogiros, J., M. N. Anagnostou, and E. N. Anagnostou, 2006: "Performance of algorithms for rainfall retrieval from polarimetric X-band radar measurements," EGU General Assembly, European Geoscience Society, Vienna, Austria.

62. Amitai, E., J. A. Nystuen, E. N. Anagnostou, and M. N. Anagnostou, 2006: "Listening to raindrops 2000 meters underwater," EGU General Assembly, European Geoscience Society, Vienna, Austria.

63. Anagnostou, M. N., E. N. Anagnostou, and J. Vivekananda, 2006: "Comparison of two X-Band DSD Retrieval Algorithms (p1.12)," in the proceedings of the 4th European Conference on Radar in Meteorology and Hydrology, European Meteorological Society, Barcelona, Spain.

64. Kalogiros, J., M. N. Anagnostou, and E. N. Anagnostou, 2006: "Rainfall Retrieval from Polarimetric X-Band Radar Measurements," in the proceedings of the 4th European Conference on Radar in Meteorology and Hydrology (3.8), European Meteorological Society, Barcelona, Spain.

65. Anagnostou, M. N., E. N. Anagnostou, and J. Vivekanandan, 2005: "Experimental Investigation of X-band Polarimetric Algorithm for Attenuation Correction and Microphysical Retrieval," in the proceedings of the National Radio Science Meeting, Boulder, Colorado.

66. Anagnostou, M. N., E. N. Anagnostou and J. Vivekanandan, 2005: "Experimental Investigation of X-band Polarimetric Algorithm for Drop Size Distribution Retrieval," in the proceedings of the, 32nd Conference on Radar Meteorology (P14R.6), American Meteorological Society, New Mexico.

67. Amitai, E., J. A. Nystuen, E. N. Anagnostou and M. N. Anagnostou, 2005: "Experimental Comparison of ambient sound from 2000 m underwater with ground-based radar observations of rainfall," in the proceedings of the 32nd Conference on Radar Meteorology (3R.5), American Meteorological Society, New Mexico.

68. Eric Defer and M. N. Anagnostou, 2005: "Characterization of the Precipitation in Southwestern Part of Greece with X-Band Doppler radar, 2D Video Disdrometer and Rain Gauges," in the proceedings of the 7th Plinius Conference on Mediterranean Storms, European Geoscience Society, Rethymno, Crete, Greece.

69. Nystuen, J. A., E. Amitai, E. N. Anagnostou, M. N. Anagnostou, and Eric Defer, 2004: "Spatial Averaging of Oceanic Rainfall Variability Using Underwater Sound," in the proceedings of the 8th International Precipitation Conference, American Geoscience Society, Vancouver, B.C., 8 – 11 August.

70. Anagnostou, M. N., E. N. Anagnostou, and W. F. Krajewski, 2004: "High-resolution rainfall rate and DSD estimation from X-band polarimetric radar measurements," in the proceedings of the 84th AMS Annual Meeting, 18th Conference on Hydrology, American Meteorological Society, 10 – 16 January, Seattle, USA.

71. Anagnostou, M. N., E. N. Anagnostou, and J. Vivekanandan, 2004: "Experimental Investigation of an X-band polarimetric algorithm for attenuation correction and microphysical retrievals," in the proceedings of the 6th International Symposium on Hydrological Applications of Weather Radar, American Meteorological Society, 2-4 February, Melbourne, Australia.

72. Sadrine, A. B., A. C. Bagtzoglou, M. N. Anagnostou, R. G. Knox and E. N. Anagnostou, 2004: "Progress toward Developing a Radar Calibration Method for Improved Rainfall Estimation," in the proceedings of the 9th ASCE, Aerospace Division International Conference, Houston, Texas, USA.

73. E. N. Anagnostou, W. F. Krajewski, M. N. Anagnostou, Anton Kruger, and Ben Miriovsky, 2002: "Radar Rainfall Estimation with an X-Band Polarimetric Radar on Wheels: Early Results," Eos. Trans., American Geoscience Society, 83(19), Spring Meet. Suppl., Abstract H22A-12.

74. Miriovsky, B. J., Kruger, A., Krajewski, W. F., Bradley, A. A., Anagnostou, E. N. and M. N. Anagnostou, 2002: "An Experimental Study of Small-Scale Drop Size Distribution Variability: Comparison with Radar Observations," Eos. Trans., American Geoscience Society, 83(47), Fall Meet. Suppl., Abstract H62 (A)-0833.

Προσκεκλημένος ομιλητής:

1. Anagnostou, M. N., T. Dakladas, E. N. Anagnostou, and J. A. Nystuen, 2015: "An autonomous and adaptive sampling low-duty cycle ambient sound sensor for marine observations: design and applications", in the proceedings of the Underwater acoustic measurements: Technologies & Results, 3rd Underwater Acoustics Conference and Exhibition, Platanias, Crete, Greece, 21 – 26 June.

2. Anagnostou, M. N., S. Pensieri, E. N. Anagnostou, R. Bozzano, R. Bechini, and J. A. Nystuen, 2013: "Acoustic signatures of the 2011 floods in the Ligurian region," in the proceedings of the Underwater acoustic measurements: Technologies & Results, 1st International conference and Exhibition on Underwater Acoustics, Corfu, Greece, 24 – 28 June.

3. Anagnostou, M. N., J. A. Nystuen, E. N. Anagnostou, A. Papadopoulos, D. Ballas, K. Nittis, P. Pagonis, L. Perivoliotis, and D. Georgopoulos, 2009: "Measurements of spatially averaged ocean surface geophysical parameters using underwater sound integrated with the Poseidon monitoring system," in the proceedings of the Underwater acoustic measurements: Technologies & Results, 3rd International conference & exhibition, Nafplion, Greece, 21 – 26 June.

4. Nittis, K., L. Perivoliotis, G. Korres, D. Ballas, A. Papadopoulos, P. Pagonis, G. Petihakis, M. N. Anagnostou, G. Georgopoulos, and E. N. Anagnostou, 2009: "Operational ocean monitoring and forecasting in the Eastern Mediterranean," in the proceedings of the Underwater acoustic measurements: Technologies & Results, 3rd International conference & exhibition, Nafplion, Greece, 21 – 26 June.