PERSONAL INFORMATION

Paolo Sanò

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WORK EXPERIENCE

From 02/01/2019 to present

Researcher

Name and address of employer

ISAC (Institute of Atmospheric Sciences and Climate) CNR (National Research Council) U.O.S. of Rome, Via Fosso del Cavaliere 100, 00133 , Rome, Italy

Main activities and responsibilities

- Remote sensing of clouds and precipitation.
- Passive microwave precipitation retrieval algorithms using data from cross-track and conical scanning satellite-borne radiometers.
- Advanced machine learning techniques.

CNR-ISAC representative in the HSAF CDOP-3 Project Team
Responsible for the development and advancement of microwave-based precipitation products (MW), under CNR-ISAC competence in the H-SAF CDOP-3 Program.
Responsible for the work package WP D-2202, H70 "New EPS-SG Precipitation Products (Algorithms) - Precipitation Rate by EPS- SG MWS".
Responsible for the work package WP WP O-2210 "Precipitation products - Operational products Group 1 Maintenance (Algorithm)"
Expert scientist in estimating satellite precipitation in the project: Copernicus Climate Change Service: Essential Climate Variable (ECV) products derived from observations Lot 1.
Collaboration in the Raincast project (ESA ITT: AO/1-9324/18/NL/NA)
(see Responsibility in National/International Projects)

Type of business or sector

Research and development. Satellite Meteorology. Remote sensing

02/01/2012 to 31/12/2018

Researcher

Name and address of employer

ISAC (Institute of Atmospheric Sciences and Climate) CNR (National Research Council) U.O.S. of Rome, Via Fosso del Cavaliere 100, 00133 , Rome, Italy

Main activities and responsibilities

- Remote sensing of clouds and precipitation.
- Passive microwave precipitation retrieval algorithms using data from cross-track and conical scanning satellite-borne radiometers, using Bayesian and neural network approaches.
- Advanced machine learning techniques

Responsible for H-SAF microwave precipitation retrieval products (H02A, H02B and H18).
Responsible for the development of microwave precipitation retrieval products, and operative data processing chain for Near Real Time monitoring within the "Intesa Operativa Dipartimento di Protezione Civile (DPC)-ISAC".
Collaboration in the development of a visualization tool (MAMS) for Near Real Time monitoring (Intesa Operativa DPC-ISAC).

Collaboration in the design and development of algorithms for the identification and the categorization of snow precipitation over Antarctic region.
Collaboration in international projects (see Responsibility in National/International Projects).

Type of business or sector: Research and development. Satellite Meteorology. Remote sensing.

From 01/09 2006 to 31/12/2011 **Research Contractor**

Name and address of employer: ISAC (Institute of Atmospheric Sciences and Climate) CNR (National Research Council) U.O.S. of Rome, Via Fosso del Cavaliere 100, 00133 , Rome, Italy

Main activities and responsibilities:

Research on surface rain rate and other meteorological parameters estimation from satellite-based passive microwave measurements. Development of passive microwave precipitation retrieval algorithms (Bayesian theory) using data from SSM/I, SSMIS and AMSR-E satellite-borne radiometers (conical scanning).

Responsible for “MW precipitation retrieval” product of ASI Nowcasting PROSA (Satellite Observation Products for Meteorological Alert) project.
Collaboration in the development of microwave precipitation retrieval products within the "Intesa Operativa Dipartimento di Protezione Civile (DPC)-ISAC”.
Collaboration in international projects FLASH, RISKMED and HSAF (see Responsibility in National/International Projects).

Type of business or sector: Research and development. Satellite Meteorology. Remote sensing.

From 02/2006 to 06/2006 **Research Contractor**

Name and address of employer: ISAC (Institute of Atmospheric Sciences and Climate) CNR (National Research Council) U.O.S. of Rome, Via Fosso del Cavaliere 100, 00133 , Rome, Italy

Main activities and responsibilities: Collaboration in research activities: Development of algorithms and analysis of Lidar data

Type of business or sector: Research and development. Atmospheric analysis

1999 **Civil service**

Name and address of employer: Hydrographic Department of National Technical Services, Via Curtatone 3 – 00185 Rome, Italy

Main activities: Development and implementation of software for meteorological data (radar/rain gauges) processing, for risk management in severe events.

Type of business or sector: Research and development for land monitoring

EDUCATION

1/09/2006 – 10/06/2010 GeoInformation Ph.D. EQF Level 8

Name and type of organisation providing education and training: University of Rome “Tor Vergata”, Department of Computer, Systems and Production Engineering, Via del Politecnico 1, 00133 Rome Italy

Principal subjects:

Remote sensing of the atmosphere, data analysis of microwave satellite-borne conical scanning radiometers (Bayesian approach), image processing, software development (Fortran, Matlab, IDL,Java) in Linux-Windows environment.
Thesis Title: “The Cloud Dynamics and Radiation Database (CDRD) approach for precipitation retrieval by means of satellite based microwave radiometry”

2006 Physics Degree (Laurea degree) at University of Rome La Sapienza EQF Level 7

Name and type of organisation providing education and training	Sapienza University of Rome, Piazzale Aldo Moro 5, 00185, Rome Italy
Principal subjects	Thesis Title: “Raman Lidar water vapour profile measurements in upper and lower troposphere”. Vote 106/110. Tutor: prof. G. Fiocco.

TRAINING

17/05/2011 – 19/05/2011

Name and type of organisation providing education and training	CASPUR (Inter-University Consortium for the Application of Super-Computing for Universities and Research), Via dei Tizii,6, 00185, Rome, Italy
Principal subjects	Introduction to parallel computing using MPI and OpenMP
Title of qualification awarded	Certificate of attendance

05/07/2007 - 07/07/2007

Name and type of organisation providing education and training	CASPUR (Inter-University Consortium for the Application of Super-Computing for Universities and Research), Via dei Tizii,6, 00185, Rome, Italy
Principal subjects	High Performance Computing (HPC)
Title of qualification awarded	Certificate of attendance

27/05/2006 - 27/07/2006

Name and type of organisation providing education and training	PC Academy Via Capodistria 12, Rome Italy
Principal subjects	Course on Java programming language
Title of qualification awarded	Certificate of attendance

PERSONAL SKILLS

Mother tongue(s): **Italian**

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
	Replace with name of language certificate. Enter level if known.				
French	A2	A2	A1	A1	A1
	Replace with name of language certificate. Enter level if known.				

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user
Common European Framework of Reference for Languages

Organisational / managerial skills: The participation in European projects required the ability to organize and conduct independent work

Digital competence

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem solving
Proficient user	Proficient user	Proficient user	Independent user	Proficient user

Levels: Basic user - Independent user - Proficient user
Digital competences - Self-assessment grid

Good knowledge of Microsoft Windows platforms (Client and Server) as user, software developer and administrator.
Good knowledge of Linux platforms (Debian, Red Hat, Fedore, Suse, Ubuntu).
Good knowledge of C and Fortran (used for scientific algorithms)
Good knowledge of Borland Delphi and Java languages.
Basic knowledge of C#.NET language.
Good knowledge of HTML and Javascript languages.
Expert in Matlab, Python, R, and IDL languages.
Good knowledge of High Performance Computing (HPC).
Good knowledge of Microsoft Office and OpenOffice.
Good Knowledge of PostgreSQL, MySQL database
User of tools for visualization and analysis of meteorological and sate llite data: GrADSG, GMT

Other skills

Satellite data acquisition and analysis. Remote sensing.
Operative algorithms design and development
Excellent knowledge of the satellite data formats (Bufr, HDF, NetCDF, GRIB ecc..)

Driving licence

Car (B) and motorcycle (A) license

Peer-reviewed Publications

1. Panegrossi, G., Marra, A. C., Sanò, P., Baldini, L., Casella, D., and Porcù, F. (2020). Heavy precipitation systems in the Mediterranean area: The role of GPM. In Satellite Precipitation Measurement (pp. 819-841). Springer. V. Levizzani, C. Kidd, D. B. Kirschbaum, C. D. Kummerow, K. Nakamura, F. J. Turk, Eds.: Dordrecht.
2. Rysman, J. F., Panegrossi, G., Sanò, P., Marra, A. C., Dietrich, S., Milani, L., Kulie, M.S, Casella, D., Camplani, A. Claud, C., Edel, L. (2019). Retrieving surface snowfall with the GPM Microwave Imager: A new module for the SLALOM algorithm. Geophysical Research Letters, 46(22), 13593-13601.
3. Marra, A. C., Federico, S., Montopoli, M., Avolio, E., Baldini, L., Casella, D., D'Adderio, L.P., Dietrich, S., Sanò, P., Torcasio R.C., Panegrossi, G. (2019). The Precipitation Structure of the Mediterranean Tropical-Like Cyclone Numa: Analysis of GPM Observations and Numerical Weather Prediction Model Simulations. Remote Sensing, 11(14), 1690.
4. D'Adderio, L. P. , F. Porcù, G. Panegrossi, A. C. Marra, P. Sanò and S. Dietrich, "Comparison of the GPM DPR Single- and Double-Frequency Products Over the Mediterranean Area," in IEEE Transactions on Geoscience and Remote Sensing, vol. 57, no. 12, pp. 9724-9739, Dec. 2019, doi: 10.1109/TGRS.2019.2928871.
5. Campanelli, M., Siani, A. M., di Sarra, A., Iannarelli, A. M., Sanò, P., Diémoz, H., Casasanta, G., Cacciani, M., Tofful, L., and Dietrich, S.: Aerosol optical characteristics in the urban area of Rome, Italy, and their impact on the UV index, Atmos. Meas. Tech. Discuss., https://doi.org/10.5194/amt-2019-300, in review, 2019.
6. Sanò, P., Panegrossi, G., Casella, D., Marra, A., D'Adderio, L., Rysman, J., & Dietrich, S. (2018). The Passive Microwave Neural Network Precipitation Retrieval (PNPR) Algorithm for the CONICAL Scanning Global Microwave Imager (GMI) Radiometer. Remote Sensing, 10, 1122.
7. Milani, L., Kulie, M.S., Casella, D., Dietrich, S., L'Ecuyer, T.S., Panegrossi, G., Porcù, F., Sanò, P., Wood, N.B.; CloudSat snowfall estimates over Antarctica and the Southern Ocean: An assessment of independent retrieval methodologies and multi-year snowfall analysis; (2018) Atmospheric Research, 213, pp. 121-135. DOI: 10.1016/j.atmosres.2018.05.015
8. Derin Y, Anagnostou E, Anagnostou MN, Kalogiros J, Casella D, Marra AC, Panegrossi G, Sano P. Passive microwave rainfall error analysis using high-resolution x-band dual-polarization radar observations in complex terrain. IEEE Transactions on Geoscience and Remote Sensing 56.5 (2018): 2565-2586.

9. Campanelli, M., Mascitelli, A., Sanò, P., Diémoz, H., Estellés, V., Federico, S., Iannarelli, A. M., Fratarcangeli, F., Mazzoni, A., Realini, E., Crespi, M., Bock, O., Martínez-Lozano, J. A., and Dietrich, S.: Precipitable water vapour content from ESR/SKYNET sun–sky radiometers: validation against GNSS/GPS and AERONET over three different sites in Europe, Atmos. Meas. Tech., 11, 81-94, https://doi.org/10.5194/amt-11-81-2018, 2018.
10. Amaral, L. Martins Costa, S. Barbieri, D. Vila, S. Puca, G. Vulpiani, G. Panegrossi, T. Biscaro, P. Sano, M. Petracca, A. C. Marra, M. Gosset, S. Dietrich, Assessment of Ground-Reference Data and Validation of the H-SAF Precipitation Products in Brazil, *Remote Sens.*, *10*(11), 1743; doi:10.3390/rs10111743, 2018.
11. Casella D., Panegrossi G., Sanò P., Marra A.C., Dietrich S., Johnson B. T., Kulie M.S. Evaluation of the GPM-DPR Snowfall Detection Capability: Comparison with CloudSat-CPR. Atm. Res., 2017,197,64-75, doi: 10.1016/j.atmosres.2017.06.018
12. Casella D., Amaral L., Dietrich S., Marra A.C., Sanò P. and Panegrossi G. The Cloud Dynamics and Radiation Database algorithm for AMSR2: exploitation of the GPM observational dataset for operational applications. JSTARS, 2017,10 (8) doi: 10.1109/JSTARS.2017.2713485
13. Marra A.C,. Porcù F, Baldini L., Petracca M., Casella D., Dietrich S., Mugnai A., Sanò P., Vulpiani G., and Panegrossi G.. Observational analysis of an exceptionally intense hailstorm over the Mediterranean area: Role of the GPM Core Observatory. Atm. Res., 2017, 192, 72-90, http://doi.org/10.1016/j.atmosres.2017.03.019
14. Federico S., Torcasio R. C., Sanò P., Casella D., Campanelli M., Meirink J. F., Wang P., Vergari S., Diémoz H., and Dietrich S..Comparison of hourly surface downwelling solar radiation estimated from MSG/SEVIRI and forecast by RAMS model with pyranometers over Italy. Atmos. Meas. Tech., 2017 10, 2337-2353, doi:10.5194/amt-10-2337-2017
15. Ursi, A., Sanò, P., Casella, D., Marisaldi, M., Dietrich, S., Tavani, M. (2017). A pipeline to link meteorological information and TGFs detected by AGILE. Journal of Geophysical Research: Space Physics 122.2 (2017): 2300-2309.
16. Ciabatta L., Marra A. C., Panegrossi G., Casella D., Sanò P., Dietrich S., Massari C., Brocca L., Daily precipitation estimation through different microwave sensors: Verification study over Italy. Journal of Hydrology, 545, 436- 450, doi: 10.1016/j.jhydrol.2016.12.057, 2017.
17. Sanò, P, Panegrossi, G., Casella, D., Marra, A. C., Di Paola, F., and Dietrich, S.: The new Passive microwave Neural network Precipitation Retrieval (PNPR) algorithm for the cross-track scanning ATMS radiometer: description and verification study over Europe and Africa using GPM and TRMM spaceborne radars, Atmos. Meas. Tech., 9, 5441-5460, doi:10.5194/amt-9-5441-2016, 2016., 2016.
18. Panegrossi G., D. Casella, S. Dietrich, A. C. Marra, M. Petracca, P. Sanò, A. Mugnai, L. Baldini, N. Roberto, E. Adirosi, R. Cremonini, R. Bechini, G. Vulpiani, and F. Porcù: Use of the GPM constellation for monitoring heavy precipitation events over the Mediterranean region, IEEE J. of Sel. Topics in Appl. Earth Obs. and Rem. Sens. (J-STARS), Volume 9, Issue 6, Pages: 2733 - 2753, doi: 10.1109/JSTARS.2016.2520660, 2016.
19. Roberto, N., Adirosi, E., Baldini, L., Casella, D., Dietrich, S., Gatlin, P., Panegrossi, G., Petracca, M., Sanò, P., and Tokay, A.: Multi-sensor analysis of convective activity in central Italy during the HyMeX SOP 1.1, Atmos. Meas. Tech., 9, 535-552, doi:10.5194/amt-9-535-2016, 2016.
20. Casella, D., Panegrossi, G., Sanò, P., Milani, L., Petracca, M., and Dietrich, S.: A novel algorithm for detection of precipitation in tropical regions using PMW radiometers, Atmos. Meas. Tech., 8, 1217-1232, doi:10.5194/amt-8-1217-2015, 2015.
21. Sanò, P, Panegrossi, G., Casella, D., Di Paola, F., Milani, L., Mugnai, A., Dietrich, S.. The Passive microwave Neural network Precipitation Retrieval (PNPR) algorithm for AMSU/MHS observations: description and application to European case studies. Atmos. Meas. Tech., 8, 837-857, 2015, doi:10.5194/amt-8-837-2015.
22. Milani, L., Porcù, F., Casella, D., Dietrich, S., Panegrossi, G., Petracca, M., and Sanò, P.: Analysis of long-term precipitation pattern over Antarctica derived from satellite-borne radar, The Cryosphere Discuss., 9, 141-182, doi:10.5194/tcd-9-141-2015, 2015.
23. Federico, S., Avolio, E., Petracca, M., Panegrossi, G., Sanò, P., Casella, D., Dietrich, S. Simulating lightning into the RAMS model: Implementation and preliminary results. Nat.. Hazards Earth Syst. Sci., 14 (11) pp. 2933 - 2950 . 2014. IF 2015:2.277.
24. Puca, S., Porcu, F., Rinollo, A., Vulpiani, G., Baguis, P., Balabanova, S., Campione, E., Ertürk, A., Gabellani, S., Iwanski, R., Jurašek, M., Kaňák, J., Kerényi, J., Koshinchanov, G., Kozinarova, G., Krahe, P., Lapeta, B., Lábó, E., Milani, L., Okon, L'., Öztopal, A., Pagliara, P., Pignone, F., Rachimow, C., Rebora, N., Roulin, E., Sönmez, I., Toniazzo, A., Biron, D., Casella, D., Cattani, E., Dietrich, S., Di Paola, F., Laviola, S., Levizzani, V., Melfi, D., Mugnai, A., Panegrossi, G., Petracca, M., Sanò, P., Zauli, F., Rosci, P., De Leonibus, L., Agosta, E., and Gattari, F.: The validation service of the hydrological SAF geostationary and polar satellite precipitation products, Nat. Hazards Earth Syst. Sci., 14, 871-889, doi:10.5194/nhess-14-871-2014, 2014.

25. Mugnai A., Casella D., E. Cattani, S. Dietrich, S. Laviola, V. Levizzani, G. Panegrossi, M. Petracca, P. Sanò, F. Di Paola, D. Biron, L. De Leonibus, D. Melfi, P. Rosci, A. Vocino, F. Zauli, S. Puca, A. Rinollo, L. Milani, F. Porcù, and F. Gattari. Precipitation Products from the Hydrology SAF. Nat. Hazards Earth Syst. Sci, 13, 1959-1981, 2013, doi:10.5194/nhess-13-1959-2013.
26. Mugnai A., E. A. Smith, G. J. Tripoli, B. Bizzarri, D. Casella, S. Dietrich, F. Di Paola, G. Panegrossi, P. Sanò. CDRD and PNPR Satellite Passive Microwave Precipitation Retrieval Algorithms: EuroTRMM / EURAINSAT Origins and H-SAF Operations. Nat. Hazards Earth Syst. Sci, 13, 887–912, 2013 doi:10.5194/nhess-13-887-2013.
27. Smith E.A., H. W.-Y. Leung, J.B. Elsner, A.V. Mehta, G.J. Tripoli, D. Casella, S. Dietrich, A. Mugnai, G. Panegrossi and P. Sanò. Transitioning from CRD to CDRD in Bayesian Retrieval of Rainfall from Satellite Passive Microwave Measurements: Part 3. Identification of Optimal Meteorological Tags. Nat. Hazards Earth Syst. Sci, 13, 1185–1208, 2013, doi:10.5194/nhess-13-1185-2013.
28. Formenton, M., Panegrossi, G., Casella, D., Dietrich, S., Mugnai, A., Sanò, P., Di Paola, F., Betz, H.-D., Price, C., and Yair, Y.: Using a cloud electrification model to study relationships between lightning activity and cloud microphysical structure, Nat. Hazards Earth Syst. Sci., 13, 1085-1104, doi:10.5194/nhess-13-1085-2013, 2013.
29. Casella D., G. Panegrossi, P. Sanò, A. Mugnai, E. A. Smith, G.J. Tripoli, S. Dietrich, M. Formenton, W.Y. Leung, A. Mehta, Transitioning from CRD to CDRD in Bayesian Retrieval of Rainfall from Satellite Passive Microwave Measurements: Part 2. Overcoming Database Profile Selection Ambiguity by Consideration of Meteorological Control on Microphysics. IEEE Trans. Geo. Rem. Sens., vol.51, no.9, 4650-4671, 2013 doi: 10.1109/TGRS.2013.2258161.
30. Sanò P, D. Casella, A. Mugnai, G. Schiavon, E.A. Smith, G.J. Tripoli, Transitioning from CRD to CDRD in Bayesian Retrieval of Rainfall from Satellite Passive Microwave Measurements: Part 1. Algorithm Description and Testing. IEEE Trans. Geo. Rem. Sens., vol. 51, no. 7, 4119-4143, july 2013, doi: 10.1109/TGRS.2012.2227332.
31. Di Paola F., D. Casella, S. Dietrich, A. Mugnai, E. Ricciardelli, F. Romano, P. Sanò, Combined MW-IR Precipitation Evolving Technique (PET) of convective rainfields. Nat. Hazards Earth Syst. Sci, 3557–3570, doi:10.5194/nhess-12-3557-2012, 2/12. 2012.
32. Casella D., S. Dietrich, F. Di Paola, M. Formenton, A. Mugnai, F. Porcù, and P. Sanò, PM-GCD A combined IR–MW satellite technique for frequent retrieval of heavy precipitation. Nat. Hazards Earth Syst. Sci., 12, 231–240, doi:10.5194/nhess-12-231-2012, 2012.
33. Dietrich, S., Casella, D., Di Paola, F., Formenton, M., Mugnai, A., and Sanò, P.: Lightning-based propagation of convective rain fields, Nat. Hazards Earth Syst. Sci., 11, 1571-1581, doi:10.5194/nhess-11-1571-2011, 2011.
34. Casella D., Mugnai A, Sanò P, Formenton M.: Microwave single-scattering properties of randomly oriented soft-ice hydrometeors. Adv. Geosci., 17; 79-85, ISSN: 1680-7340, 2008.

Proceedings

1. Panegrossi G., Rysman J-F, Casella D., Sanò P., Marra A.C., Dietrich S., Kulie M.S.; Exploitation Of Gpm/Cloudsat Coincidence Dataset For Global Snowfall Retrieval; 2018 IEEE Proc. IGARSS, 22-27 July, Valencia, Spain, 2018.
2. Kidd C., Panegrossi G., Sanò P., Ringerud S., Stocker E., Casella D.: Intercomparison of precipitation products over Western Europe from the EUMETSAT H-SAF and NASA PPS 2017 EUMETSAT Meteorological Satellite Conference, October 2017, Rome, Italy, 2017
3. Sanó P., Panegrossi G., Casella D., Marra A.C., Martins Costa do Amaral L., Dietrich S.; The Passive Microwave Neural Network Precipitation Retrieval (PNPR) for the Conical Scanning GMI Radiometer: description and application to case studies; 2017 Eumetsat meteorological satellite conference, 2-6 October, Rome 2017
4. G. Panegrossi, D. Casella, S. Dietrich, A.C. Marra, L. Martins Costa do Amaral, P. Sanò: The new Bayesian algorithms for AMSR2 and GMI; 2017 Eumetsat meteorological satellite conference, 2-6 October, Rome 2017
5. Marra A. C., Panegrossi G., Sanò P., Dietrich S., Casella D., Ciabatta L., Massari C., Brocca L.: Verification study of MW-based gridded daily precipitation estimates: perspectives for the future development of H-SAF
6. Petracca M.,F. Porcù, D. Casella, S. Dietrich, A. C. Marra, G. Panegrossi, P. Sanò (2015), Study of lightning initiation from MSG super rapid scan service over Italy, EUMETSAT Meteorological Satellite Conference, Toulouse, Sept. 2015, 2015
7. Sanò P., D. Casella, G. Panegrossi, A. C. Marra, M. Petracca, and S. Dietrich, The Passive Microwave Neural Network Precipitation Retrieval (PNPR) for the Cross-track Scanning ATMS Radiometer, EUMETSAT Meteorological Satellite Conference, Toulouse, Sept. 2015, 2015
8. Panegrossi G., D. Casella, S. Dietrich, A. C. Marra, M. Petracca, P. Sanò, L. Baldini, N. Roberto, E. Adirosi, R. Cremonini, R. Bechini, G. Vulpiani: Use of the constellation of PMW radiometers in the GPM ERA for heavy precipitation event monitoring and analysis during fall 2014 in Italy, IEEE

Proc. IGARSS, DOI: 10.1109/IGARSS.2015.7326993, 2015

9. Panegrossi G., D. Casella, S. Dietrich, A. C. Marra, M. Petracca, P. Sanò, L. Baldini, N. Roberto, E. Adirosi, R. Bechini, R. Cremonini, G. Vulpiani, and F. Porcù: Use of the GPM constellation for monitoring and analysis of heavy precipitation events in Italy during fall 2014, EUMETSAT Meteorological Satellite Conference, Toulouse, Sept. 2015, 2015
10. Panegrossi G., D. Casella, S. Dietrich, A. C. Marra, L. Milani, M. Petracca, P. Sanò, and A. Mugnai. CDRD and PNPR passive microwave precipitation retrieval algorithms: extension to the MSG full disk area in 2014 EUMETSAT Meteorological Satellite Conference, Geneva, 22-26 Sept. 2014
11. Panegrossi G., D. Casella, S. Dietrich, P. Sanò, M. Petracca, and A. Mugnai (2013) A verification study over Europe of AMSU-A/MHS and SSMIS passive microwave ¬precipitation retrievals in 2013 Joint EUMETSAT/AMS Meteorology Satellite Conference, Vienna, Austria
12. Petracca M., D. Casella, S. Dietrich, G. Panegrossi, P. Sanò (2013) Multisensor Atmospheric data Mapping System: a Web-based Graphic Tool for multisensor observations of atmospheric data and NWP model forecasts in 2013 Joint EUMETSAT/AMS Meteorology Satellite Conference, Vienna
13. Sanò P., D. Casella, S. Dietrich, G. Panegrossi, M. Petracca, and A. Mugnai (2013) Passive microwave Neural network Precipitation Retrieval (PNPR): an algorithm for cross-track scanning radiometers in 2013 Joint EUMETSAT/AMS Meteorology Satellite Conference, Vienna, Austria
14. Porcù F., U. Gjoka., S. Dietrich, P. Sanò, D. Casella, A. Mugnai. Satellite Precipitation Estimation over the Tibetan Plateau and Perspectives for new Satellite Missions in WATGLOBS, Beijing, China, 26-30 April, 2013.
15. Dietrich S., V. Levizzani, A. Mugnai, D. Casella, E. Cattani, S. Laviola, G. Panegrossi, P. Sanò. Satellite-based precipitation measurements in Europe: the algorithms for H-SAF Proc. International Workshop on Terrestrial water cycle observation and modeling from Space: Innovation and reliability of data products, Beijing, China, April 2013, Beijing, China, 26-30 April, 2013.
16. Casella, D.; Dietrich, S.; Formenton, M.; Mugnai, A.; Panegrossi, G.; Sanò, P.; Smith, E.A.; Tripoli, G.J.: Verification of Cloud Dynamics and Radiation Database (CDRD) passive microwave precipitation retrieval algorithm using TRMM satellite radar and radiometer measurements over Southern Mediterranean Basin, 12th Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment (MicroRad), 2012 , , vol., no., pp.1-4, 5-9 March 2012 doi: 10.1109/MicroRad.2012.6185243.
17. A. Mugnai et al. Precipitation Product from the Hydrology SAF in 2012 EUMETSAT Meteorological Satellite Conference
18. S. Puca, et al. The validation service of the hydrological SAF geostationary and polar satellite precipitation products Proc. 2012 EUMETSAT Meteorology Satellite Conference, Sopot, Poland, 2012.

19. Panegrossi G., D. Casella, E. Cattani, S. Dietrich, S. Laviola, V. Levizzani, A.Mugnai, P. Sanò, D. Biron, L. De Leonibus, D. Melfi, P. Rosci, A. Vocino, F. Zauli, L. Milani, F. Porcù, S. Puca, A. Rinollo, and F. Gattari, Precipitation Products from the Hydrology SAF, Proc. 2012 EUMETSAT Meteorology Satellite Conference, Sopot, Poland, 2012.
20. Casella, D., Dietrich, S., Formenton, M., Mugnai, A., Panegrossi, G., Sanò, P., Smith, E.A., and Tripoli, G.J: Verification of Cloud Dynamics and Radiation Database (CDRD) passive microwave precipitation retrieval algorithm using TRMM satellite radar and radiometer measurements over southern Mediterranean basin, in: Extended Abstract Volume of the 12th Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment, Rome, Italy, 5-9 March 2012, 4 pp., 2012
21. S. Puca, et al. The validation service of the hydrological SAF geostationary and polar satellite precipitation products Proc. 2012 EUMETSAT Meteorology Satellite Conference, Sopot, Poland, 2012.
22. Panegrossi G., D. Casella, E. Cattani, S. Dietrich, S. Laviola, V. Levizzani, A.Mugnai, P. Sanò, D. Biron, L. De Leonibus, D. Melfi, P. Rosci, A. Vocino, F. Zauli, L. Milani, F. Porcù, S. Puca, A. Rinollo, and F. Gattari, Precipitation Products from the Hydrology SAF, Proc. 2012 EUMETSAT Meteorology Satellite Conference, Sopot, Poland, 2012.
23. Casella, D., Dietrich, S., Formenton, M., Mugnai, A., Panegrossi, G., Sanò, P., Smith, E.A., and Tripoli, G.J: Verification of Cloud Dynamics and Radiation Database (CDRD) passive microwave precipitation retrieval algorithm using TRMM satellite radar and radiometer measurements over southern Mediterranean basin, in: Extended Abstract Volume of the 12th Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment, Rome, Italy, 5-9 March 2012, 4 pp., 2012

Responsibilities in National/International Projects

2017-2022 EUMETSAT Satellite Application Facility on Support to Operational Hydrology and Water Management (H SAF) Third Continuous Operations and Development Phase (CDOP-3)
Objectives: EUMETSAT H-SAF is one of the current eight EUMETSAT SAFs. H-SAF provides precipitation operational products based on a series of advanced and ever improving algorithms developed at CNR-ISAC. During CDOP-3 the main focus at CNR-ISAC unit will be the release of advanced precipitation products for the next geostationary (GEO) Meteosat Third Generation (MTG) satellite and Low Earth Orbit (LEO) EPS-Second Generation (SG) radiometers Microwave Imager, MWI, Ice Cloud Imager (ICI), and Microwave Sounder (MWS).
Responsibilities: CNR-ISAC representative in the HSAF CDOP-3 Project Team
Responsible for the development and advancement of microwave-based precipitation products (MW), under CNR-ISAC competence in the H-SAF CDOP-3 Program.
Responsible for the work package WP D-2202, H70 "New EPS-SG Precipitation Products (Algorithms) - Precipitation Rate by EPS- SG MWS".
Responsible for the work package WP WP O-2210 "Precipitation products - Operational products Group 1 Maintenance (Algorithm)"
Refrences: H-SAF Agreement H-SAF_CDOP-3 Prot. 0001479 28-03-2107
Leading Entity: Italian Air Force
Total Budget:: Euro ~ Euro13.6M; (CNR ISAC Unit: ~ 1.3M (~550K from EUMETSAT)

2018-2021 Copernicus Climate Change Service: Essential Climate Variable (ECV) products derived from observations Lot 1: precipitation, surface radiation budget, water vapour, cloud properties, and Earth radiation budget
Objectives: Contribute to the ECMWF Climate Data Store (CDS), providing open, free access to quality-assured, global and regional Essential Climate Variable (ECV) products derived from observations.
Responsibilities: Collaboration in scientific activity as an expert in estimating satellite precipitation. Collaboration in the development of the algorithm for the estimation of precipitation from microwave radiometers from MHS / AMSU-B satellite with neural network approach.
References: Copernicus Climate Change Service 312b (C3S_312b)
PI: Dr. Rainer Hollman (DWD, Germany)
Total Budget: 4 MEuro

2019-2020 Raincast. ESA ITT: AO/1-9324/18/NL/NA
Objectives: multi-platform and multi-sensor study to address the requirement from the research and operational communities for global precipitation measurements**.**
Responsibilities: Collaboration in the activity related to WP 3200 “Passive microwave capability to detect and quantify snowfall and light precipitation at higher latitudes”
Partners: ESA, Univ. of Leicester, CNR-ISAC, Mc.Gill Univ.
Total budget: 250KEuro

2014-2016 PNRA PDR 2013 B3.01 “Characterization of precipitation in the Antarctic region based on satellite observations”
Objectives: Defining a methodology for the characterization of the different types of precipitation in the Antarctic region based on active and passive satellite measurements
Responsabilities: Collaboration in data analysis and radiative transfer simulations of microwave radiometers measurements over Antarctic area. Collaboration in the design and development of an algorithm for the identification and categorization of snow precipitation (Prot: ISAC-CNR-ISAC 0001243 09/04/2016).
Reference: PNRA PDR 2013 B3.01, cooperation agreement: ISAC-CNR-ISAC 002439 date: 11/06/2014, ISAC-CNR-ISAC prot. 0000923 date : 13/03/2012
Partners: MIUR, PNRA, CNR-ISAC, CNR-IMAA, Ferrara University.
Total Budget: 80.000 €

2012- 2017 Project: “Satellite Application Facility on Support to Operational Hydrology and Water Management (H SAF) - Second Continuous Development and Operational Phase (CDOP-2)”
Objectives: Provide new satellite-derived products from existing and future satellites with sufficient time and space resolution to satisfy the needs of operational hydrology;
Perform independent validation of the usefulness of the new products for fighting against floods, landslides, avalanches, and evaluating water resources.

Responsibilities: Responsible for the service package SP2220 (products H02A, H02B and H18) “Precipitation rate at ground by MW cross track scanners”. Writing of technical and scientific reports.
Reference: ISAC-CNR-ISAC prot. 0000923 data : 13/03/2012; SAF/HSAF/CDOP2/PP/1.0 11 Dic. 2012 “CDOP2 Project Plan”
Partners: EUMETSAT, Italian Air Force Meteorological Service, Civil Protection, Zentralanstalt für Meteorologie und Geodynamik, Finnish Meteorological Institute, European Centre for Medium-Range Weather Forecasts, Turkish State Meteorological Service, Institute of Meteorology and Water Management, Italian Institute of Atmospheric Sciences and Climate, ELSAG DATAMAT, Országos Meteorológiai Szolgálat, Météo-France, Royal Meteorological Institute of Belgium, Slovenský hydrometeorologický ústav, TuWien / IPF, German Federal Institute of Hydrology, Aalto University School of Science and Technology, Meteo Romania, Anadolu University, Ferrara University, Istanbul Technical University, Finnish Environment Institute, Centre national de la recherche scientifique.
Total Budget: 13.129.000 € in 5 years (540.000 € in 5 years to CNR-ISAC).

2011 Project: “EUMETSAT Satellite Application Facility on Support to Operational Hydrology and Water Management (H-SAF)- Continuous Development and Operational Phase (CDOP)”, hosted by Italian Meteorological Service.
Objectives: Provide new satellite-derived products from existing and future satellites with sufficient time and space resolution to satisfy the needs of operational hydrology;
Perform independent validation of the usefulness of the new products for fighting against floods, landslides, avalanches, and evaluating water resources.
Responsibilities: Responsible for the development of PR-OBS-01 product: “Precipitation rate at ground by MW conical scanners”. Writing of technical and scientific reports.
References: Statement letter of 01/03/2010 (Dr. Alberto Mugnai). SAF/HSAF/PP/3.0 15 Sett. 2010 “H-SAF Project Plan “
Partners: EUMETSAT, Italian Air Force Meteorological Service, Civil Protection, Zentralanstalt für Meteorologie und Geodynamik, Finnish Meteorological Institute, European Centre for Medium-Range Weather Forecasts, Turkish State Meteorological Service, Institute of Meteorology and Water Management, Italian Institute of Atmospheric Sciences and Climate, ELSAG DATAMAT, Országos Meteorológiai Szolgálat, Météo-France, Royal Meteorological Institute of Belgium, Slovenský hydrometeorologický ústav, TuWien / IPF, German Federal Institute of Hydrology, Aalto University School of Science and Technology, Meteo Romania, Anadolu University, Ferrara University, Istanbul Technical University, Finnish Environment Institute, Centre national de la recherche scientifique.
Total Budget: 1.900.000 € in 1 year (185.000 € in 1 year to CNR-ISAC).

2005-2010 Project: “EUMETSAT Satellite Application Facility on Support to Operational Hydrology and Water Management” (H-SAF)”, hosted by Italian Meteorological Service.
Objectives: Provide new satellite-derived products from existing and future satellites with sufficient time and space resolution to satisfy the needs of operational hydrology;
Perform independent validation of the usefulness of the new products for fighting against floods, landslides, avalanches, and evaluating water resources.
Responsibilities: Responsible for the development of PR-OBS-01 product: “Precipitation rate at ground by MW conical scanners”. Writing of technical and scientific reports.
References: Statement letter of 01/03/2010 (Dr. Alberto Mugnai). H-SAF/RR/DOC.1 3 Aprile 2016 ”H-SAF Project Plan”.
Partners: EUMETSAT, Italian Air Force Meteorological Service, Civil Protection, Zentralanstalt für Meteorologie und Geodynamik, Finnish Meteorological Institute, European Centre for Medium-Range Weather Forecasts, Turkish State Meteorological Service, Institute of Meteorology and Water Management, Italian Institute of Atmospheric Sciences and Climate, ELSAG DATAMAT, Országos Meteorológiai Szolgálat, Météo-France, Royal Meteorological Institute of Belgium, Slovenský hydrometeorologický ústav, TuWien / IPF, German Federal Institute of Hydrology, Aalto University School of Science and Technology, Meteo Romania, Anadolu University, Ferrara University, Istanbul Technical University, Finnish Environment Institute, Centre national de la recherche scientifique
Total Budget: 5.000.000 € in 5 years (450.000 € in 5 years to CNR-ISAC).

2014 “Intesa Operativa DPC-ISAC”
Objectives: Estimates of instantaneous precipitation from MW radiometers;
Estimates of instantaneous and cumulate precipitation with combined IR and MW techniques; Precipitation Nowcasting; Near Real Time visualization of Precipitation products and forecasts.
Responsibilities: Responsible for module 1 (Estimates of instantaneous precipitation from MW radiometers - WP2 - satellite meteorology). Writing of technical and scientific reports.

Reference: ISAC-CNR-ISAC 0001185 date 14/04/2016.
Partners : "Dipartimento di Protezione Civile", CNR-ISAC.
Total Budget: 150.000 € (70.000 € to my unit).

2013 "Intesa Operativa DPC-ISAC"
Objectives: Estimates of instantaneous precipitation from MW radiometers; Estimates of instantaneous and cumulate precipitation with combined IR and MW techniques; Precipitation Nowcasting; Near Real Time visualization of Precipitation products and forecasts.
Responsibilities: Collaboration in Module 1 "Stima della precipitazione istantanea da radiometri alle MW" (Resp. G. Panegrossi); Collaboration in Module 3 "Stime di precipitazione istantanea e cumulata con tecniche PET" (Resp. S. Dietrich); Technical support to the modules: "Attività di sviluppo della catena operativa" (Resp. S. Dietrich); " Organizzazione sito web e piattaforma di visualizzazione: Multisensor Atmospheric data Mapping System (MAMS)" (Resp. S. Dietrich); Writing of technical and scientific reports.
Reference: ISAC-CNR-ISAC 0001186 data 14/04/2016.
Partners : "Dipartimento di Protezione Civile", CNR-ISAC.
Total Budget: 150.000 € (70.000 € to my unit).

2007–2011 ASI Nowcasting Project: "Prodotti di Osservazione Satellitare per Allerta Meteorologica" (PROSA). Coordinator Prof. Franco Prodi (Ferrara University).
Objectives: Prosa is funded by the Italian Space Agency (ASI). Main project's objectives are: the design, development, testing and demonstration of a prototype system dedicated to the innovative dynamic characterization of meteorological parameters at ground, aimed at supporting the Italian Department of Civil Protection (DPC) in managing the risks associated with floods and hydro-geological hazardous events.
Responsible for the development of MW products (conical scanners). Writing of technical and scientific reports.
Reference: assignment letter, Carlo Gavazzi Space Spa (dr.ssa Tampellini , project manager, January 2010). Statement letter of 01/03/2010 (Dr. Alberto Mugnai).
Partners: CNR - ISAC, Carlo Gavazzi Space SpA, ACS, Merlino Technology s.r.l., CNR IFAC, La Sapienza - Università degli Studi di Roma, Università di Ferrara, Politecnico di Bari, Università di Camerino , CETEMPS.

2006 – 2010 Project: "Observations, Analysis and Modeling of Lightning Activity in Thunderstorms for use in Short Term Forecasting of Flash Floods" (FLASH). Coordinator Prof. Colin Price (Tel Aviv University, Israel).
Objectives: The main goal of the project is the development of rainfall-lightning relationships using lightning and precipitation data sets in the Mediterranean region, and the use of lightning information in conjunction with infrared / microwave observations from geostationary / low earth orbiting satellites to improve cloud characterization, convection detection and precipitation retrieval from space.
Responsibilities: Participation in the research on precipitation retrieval using lightning data in combination with passive-microwave (MW) measurements from Low Earth Orbit (LEO) satellites and visible-infrared (VIS-IR) measurements from geosynchronous (GEO) Meteosat Second generation (MSG) satellites. Writing of technical and scientific reports.
Reference: Statement letter of 01/03/2010 (Dr. Alberto Mugnai).
Partners: Tel Aviv University - Israel, The Open University - Israel, CNR-ISAC - Italy, National Observatory of Athens - Greece, University of Barcelona - Spain, Ministry of Agriculture / Natural Resources and Environment / Cyprus Meteorological Service - Cyprus, The Hebrew University - Jerusalem, Polytechnic University of Madrid, University of Cyprus

2006–2008 UE INTERREG IIIB Project: "Weather Risk Reduction in the Central and Eastern Mediterranean" (RISKMED), Coordinator Prof. Aristide Bartzokas (Ioannina University, Greece)
Objectives: The main goal of the project is the accurate prediction of adverse weather events and the dissemination of warnings to the relevant authorities and to the public. For this purpose, the main objective of the research is to build an early warning system to provide accurate and detailed weather forecasts and to disseminate the corresponding warnings.
Responsabilities: Collaboration in research activities. Writing of technical and scientific reports

Reference: Statement letter of 01/03/2010 (Dr. Alberto Mugnai).
Partners: University of Ioannina, Region of Epirus, Italian National Research Council / Institute of Atmospheric Sciences and Climate, University of Malta / IOI-Malta Operational Centre, Calabria Region, Cyprus Meteorological Service, National Observatory of Athens.

Teaching Activities

14-1814-18/07/2014 Lecturer at the EUMETSAT International Remote Sensing School for Hydrological Applications 2014: Precipitation Product Application for Severe Events Monitoring
Course program: http://hsaf.meteoam.it/news-20140714.php

23-24/02/2011 Lecturer at the PROSA Precipitation Products Users Training Course. Theory and exercises

Service

Organizing Committee

03/2016 Member of the organizing Committee of the IV Skynet international Workshop (http://romaskynet.artov.isac.cnr.it).

Member of recruitment commissions

10/09/2015 Reference: Bando N. ISAC-02-2015-RM prot. ISAC-CNR: 0003582 of 07/09/2015.26/02/2016
22/03/2016 Reference**:** Bando N. ISAC-BS02-2016-RM prot. ISAC-CNR: 0000600 of 23/02/201

Peer reviewer for:

AMS Journal of Atmospheric and Oceanic Technology
AMS Journal of Hydrometeorology
IEEE Geoscience and Remote Sensing Letters

Conferences (2016-2019)

1. Panegrossi G, Marra A , D'Adderio L , Dietrich S , Sanò P , Federico S , BaldiniL , Montopoli M , Porcù, Characterization and monitoring of heavyprecipitation events in the Mediterranean area: role of the GPM mission,ESA Living Planet Symposium, Milan 13-17 May 2019.
2. Marra A. C., G. Panegrossi, D. Casella, L. P. D'Adderio, S. Dietrich, P. Sanò, and S. Federico: Characterization and monitoring of heavy precipitation events in the Mediterranean area: role of the GPM mission, 2019 EGUGeneral Assembly, Vienna, April 2019
3. Camplani A., G. Panegrossi, P. Sanò, D. Casella, A. C. Marra, S. Dietrich, M. Crespi, CloudSat-based assessment of ATMS snowfall observation capabilities, 2019 EGU General Assembly, Vienna, April 2019
4. Ciabatta L., C. Massari, G. Panegrossi, A. C. Marra, P. Filippucci, P. Sanò, S.Dietrich, D. Melfi, L. Brocca: The HSAF H64 soil moisture-precipitation integrated product: development and preliminary results, 2019 EGU General Assembly, Vienna, April 2019
5. Panegrossi G., J-F Rysman, P. Sanò, A. C. Marra, L. P. D'Adderio, and S.Dietrich, H SAF-GPM collaboration activity on precipitation retrieval:SLALOM and PNPR, PMM Science Team Meeting 2018, Phoenix, AZ. USA,Oct. 2018
6. Panegrossi G., J. F. Rysman, P. Sanò, A. C. Marra, S. Dietrich, D. Casella, and M. Kulie: On the use of spaceborne active and passive microwave coincident observations: perspectives for EPS-SG MWI and MWS global precipitation products, EUMETSAT Meteorological Satellite Conference 2018, Tallin,Estonia, 2018
7. Panegrossi, G. J.F. Rysman, D. Casella, P. Sanò, A. C. Marra, S. Dietrich, M. S.Kulie Exploitation of GPM/CloudSat Coincidence Dataset For Global SnowfallRetrieval, 2018 IEEE Proc. IGARSS, 22-27 Luglio, Valencia, Spagna, 2018
8. Rysman J.-F., A. C. Marra, G. Panegrossi, P. Sanò, L. P. D'Adderio, S. Dietrich, D. Casella Heavy snow events over the Mediterranean basin: applications of a new GPM Microwave Imager snowfall retrieval algorithm, 11th HyMeX Workshop, Lecce, May 2018.

9. Rysman, J-F, G. Panegrossi, A. C. Marra, P. Sanò, S. Dietrich, L. Milani, M. Kulie, Snowfall retrieval algorithm for the GPM Microwave Imager exploiting CloudSat/Calipso, 2018 EGU General Assembly, Vienna April 2018.
10. Sanò P., Panegrossi G., Casella D., A.C. Marra, Rysman J.F., Dietrich S., Design and Performances of the Passive Microwave Neural Network Precipitation Retrieval (PNPR) Algorithm for the Conical Scanning GMI Radiometer, 2018 EGU General Assembly, Vienna April 2018.
11. J. F. Rysman, A. C. Marra, G. Panegrossi, P. Sanò, L. P. D'Adderio, S. Dietrich, D. Casella, Exploitation of GPM/CloudSat coincidence dataset for global snowfall retrieval. IGARSS 2018, Valencia, Spain, 22 27 July 2018.
12. Derin Y., E.Anagnostou, M. Anagnostou, J. Kalogiros, D. Casella, A. C. Marra, G. Panegrossi, P. Sanò, Passive Microwave Precipitation Retrieval Uncertainty Characterized based on Field Compaign Data over Complex Terrain, AGU Meeting, San Francisco, CA, December 2017.
13. Panegrossi G., P. Sanò, A. C. Marra, J.-F. Rysman, D. Casella, S.Dietrich, B. Johnson, M. Kulie, HSAF-GPM collaboration activity: assessment of GMI snowfall detection capabilities based on synergistic CloudSat observations (and the new PNPR for GMI), PMM Science Team Meeting 2017, San Diego, CA, 16-20 October 2017.
14. Panegrossi G., P. Sanò, A. C. Marra, D. Casella, S. Dietrich, B. Johnson, M. S. Kulie, Passive Microwave Precipitation products in H-SAF: recent developments and related activities within the collaboration with GPM, 2017.
15. Petracca M., S. Puca, S. Sebastianelli, G. Vulpiani, L. P. D'Adderio, F. Porcu, P. Sanò, S. Dietrich, A. C. Marra, G. Panegrossi, Evaluation of different GMI products over Italy using H-SAF validation methodology, 2017 EUMETSAT Meteorological Satellite Conference, October 2017, Rome, Italy, 2017.
16. Marra A. C., D. Casella, L. M. Amaral, P. Sanò, S. Dietrich, and G. Panegrossi, The new Cloud Dynamics and Radiation Database algorithms for AMSR2 and GMI: exploitation of the GPM observational database for operational applications, 2017 EUMETSAT Meteorological Satellite Conference, October 2017, Rome, Italy, 2017.
17. Sanò P., G. Panegrossi, D. Casella, A. C. Marra, L. Amaral, S. Dietrich, The Passive Microwave Neural Network Precipitation Retrieval (PNPR) for the Conical Scanning GMI Radiometer: description and application to case studies, 2017 EUMETSAT Meteorological Satellite Conference, October 2017, Rome, Italy, 2017.
18. Panegrossi G., A. C. Marra, P. Sanò, St. Dietrich, D. Casella, L. Ciabatta, C. Massari, L. Brocca Verification study of microwave-based gridded daily precipitation estimates: perspectives for the future development of H-SAF H23 product, (3), 2017 EUMETSAT Meteorological Satellite Conference, October 2017, Rome, Italy, 2017.
19. Panegrossi G., S. Dietrich, A. C. Marra, P. Sanò, D. Casella, L. Baldini, A. Mugnai, G. Vulpiani, M. Petracca, F. Porcu, Role and capabilities of the GPM mission in the characterization and monitoring of extreme precipitation events in the Mediterranean region, 10th Hymex Workshop, 4-7 July 2017,Barcelona, Spain, 2017.
20. Panegrossi G., Casella D., Dietrich S., Marra A. C., J-F- Rysman, Sanò P., Kulie M. S., and Johnson B. T., Use of coincident radar and radiometer observations from GPM and CloudSat for global spaceborne snowfall observation assessment, 1st International Summer Snowfall Workshop, 28- 30 June 2017, Cologne, Germany, 2017.
21. Marra A.C., F. Porcù, L. Baldini, M. Petracca, D. Casella, S. Dietrich, A. Mugnai, P. Sanò, G. Vulpiani, and G.Panegrossi, The exceptional hailstorm over the Gulf of Naples on 5 September 2015: an observational analysis exploting active and passive microwave observations from the GPM Core Observatory, 2nd European Hail Workshop, 19-21 April 2017, Bern, Switzerland, 2017.
22. Panegrossi G., Casella D., Sanò P., Marra A. C., Dietrich S., Kulie M. S., and Johnson B. T., Use of coincident radar and radiometer observations from GPM, ATMS, and CloudSat for global spaceborne snowfall observation assessment, EGU General Assembly 2017, Vol. 19, EGU2017-14114-2, 24-28April 2017, Vienna, Austria, 2017.
23. Marra A. C., Casella D., Amaral L., Sanò P., Dietrich S., Panegrossi G., The new Cloud Dynamics and Radiation Database algorithm for AMSR2 and GMI: exploitation of the GPM

observational database for operational applications, EGU General Assembly 2017, Vol. 19, EGU2017-8383-2, 24-28 April 2017,Vienna, Austria, 2017.

24. Panegrossi G., D. Casella, S. Dietrich, A. C. Marra, P. Sanò, L. Baldini, M. Petracca, and F. Porcù: Role and capabilities of GPM mission in the characterization and monitoring of extreme precipitation events in the Mediterranean region, IV Annual Conference Of The Italian Society For Climate Sciences 2016, Cagliari, Italy, 19-20 Oct. 2016, 2016.
25. Casella D., Panegrossi G., Sano P., Marra A. C., Dietrich S., Kulie M. S., and Johnson B. T.: Active and passive microwave observations of snowfall fromspace, 8th IPWG and 5th IWSSM Workshop, Bologna Italy, 3-7 October 2016, 2016.
26. Amaral L., G. Panegrossi, D. Casella, A. C. Marra, P. Sanò, S. Dietrich, and D. Vila: Investigation on CDRD and GPROF performance over central Amazon region during GoAmazon/CHUVA campaigns, 8th IPWG and 5th IWSSM Workshop, Bologna Italy, 3-7 October 2016, 2016.
27. Alcoba, A., M. Gosset, G. Panegrossi, M. Kacou, D. Casella, A. C. Marra, P. Sanò, S. Dietrich: Validation study of CDRD and PNPR precipitation microwave retrieval (Level 2) over West Africa using X-pol radar and rain gauges observations, 8th IPWG and 5th IWSSM Workshop, Bologna Italy, 3-7 October 2016, 2016.
28. Marra A. C., G. Panegrossi, D. Casella, P. Sanò, S. Dietrich, L. Ciabatta, C. Massari, and L. Brocca: Verification study over Africa and Europe of gridded daily precipitation obtained by merging multiple microwave-based satellite products, 8th IPWG and 5th IWSSM Workshop, Bologna Italy, 3-7 October 2016, 2016.
29. Marra A.C., Panegrossi G., Casella D., Sanò P., Dietrich S., Mugnai A., Baldini L., Petracca M., Vulpiani G., and Porcu F., 2016. Multisensor analysis of an impressive hail storm: observations by GPM of extremely rare features over the Mediterranean region. 15th Plinius Conference on Mediterranean Risks. Vol. 15, Plinius15-68, 8-11 June 2016, Giardini Naxos, Italy.
30. Panegrossi G., Casella D., Dietrich S., Marra A.C., Sanò P., Mugnai A., Baldini L., Roberto N., Adirosi E., Cremonini R., Bechini R., Vulpiani G., Petracca M., and Porcu F. , 2016. On the use of GPM constellation for monitoring heavy precipitation events over the Mediterranean region. 15th Plinius Conference on Mediterranean Risks. Vol. 15, Plinius15-31, 8-11 June 2016, Giardini Naxos, Italy.
31. Marra A.C., Panegrossi G., Casella D., Sanò P., Dietrich S., Baldini L., Petracca M., and Porcu F., 2016 GPM observations of a tropical-like hailstorm over the Mediterranean Sea. EGU General Assembly, Vol. 18, EGU2016-17304-1,17–22 April 2016, Vienna, Austria..
32. Sanò P., Casella D., Panegrossi G., Marra A.C., and Dietrich S., 2016. The Passive Microwave Neural Network Precipitation Retrieval (PNPR) for AMSU/MHS and ATMS cross-track scanning radiometers. EGU General Assembly, Vol. 18, EGU2016-15021-1, 17–22 April 2016, Vienna, Austria.
33. Panegrossi G., Casella D., Marra A.C, Sanò P., Dietrich S., Brocca L., Ciabatta L., and Massari C., 2016. Estimation of daily rainfall over Italy by merging multiple microwave-based satellite products. EGU General Assembly, Vol. 18, EGU2016-18080-3, 17–22 April 2016, Vienna, Austria.

Technical documentation

1. Dietrich S., P. Sanò, G. Panegrossi, D. Casella, S. Federico, A. Mascitelli, C. Transerici, P. Malguzzi, O. Drofa, D. Mastrangelo, L. Baldini, N. Roberto, E. Adirosi, M. Montopoli: “INTESA OPERATIVA TRA PRESIDENZA DEL CONSIGLIO DEI MINISTRI, DIPARTIMENTO DELLA PROTEZIONE CIVILE (DPC) E ISTITUTO DI SCIENZE DELL'ATMOSFERA E DEL CLIMA CONSIGLIO NAZIONALE DELLE RICERCHE (CNR-ISAC) 2016 RELAZIONE FINALE, 2016.
2. Panegrossi, G., D. Casella, Kulie M. S., Johnson B. T, Sanò P., H-SAF Federated Activity (H_SAF_FA15_01) “Cooperation on the use of combined spaceborne active and passive MW observations for precipitation retrieval”, Final Report, Nov. 2017, pp.38 (participation in).
3. Panegrossi, G., D. Casella, Kulie M. S., Johnson B. T, Sanò P., H-SAF Federated Activity (H_SAF_FA15_01) “Cooperation on the use of combined spaceborne active

and passive MW observations for precipitation retrieval", Mid Term Report, Dec. 2016, pp.41 (participation in).
4. H-SAF - Algorithm Theoretical Baseline Document (ATBD) for product H70 – P-IN-MWS Precipitation rate at ground by EPS-SG cross-track scanner Microwave Sounder (MWS), 21/05/2020.
5. H-SAF – Products Validation Report (PVR) - PR-OBS-01 ver. 1.7 - Precipitation rates at ground by MW conical scanners, 31/01/2013 (participation in).
6. H-SAF – Products Validation Report (PVR) - PR-OBS-02 ver. 2.4 - Precipitation rates at ground by MW cross track scanners, 31/01/2013 (participation in).
7. H-SAF - Product User Manual (PUM) for product H01 – PR-OBS-1 ver. 1.7 - Precipitation rate at ground by MW conical scanners, 31/01/2013 (participation in).
8. H-SAF - Product User Manual (PUM) for product H02 – PR-OBS-2 ver. 2.4 - Precipitation rate at ground by MW cross track scanners, 31/01/2013 (participation in).
9. H-SAF - Algorithm Theoretical Baseline Document (ATBD) for product H01 – PR-OBS-1 ver. 1.7 Precipitation rate at ground by MW conical scanners, 31/01/2013 (participation in).
10. H-SAF - Algorithm Theoretical Baseline Document (ATBD) for product H02 – PR-OBS-2 ver. 2.4 Precipitation rate at ground by MW cross track scanners, 31/01/2013 (participation in).
11. H-SAF - Algorithm Theoretical Baseline Document (ATBD) for product H18 – Precipitation rate at ground by ATMS MW cross-track scanner, 31/1/2016 (participation in).
12. Dietrich S., D. Casella, E. Cattani, S. Laviola, G. Panegrossi, M. Petracca, P. Sanò, A. Buzzi, P. Malguzzi, O. Drofa, L. Baldini, S. Sebastianelli,: "INTESA OPERATIVA TRA PRESIDENZA DEL CONSIGLIO DEI MINISTRI, DIPARTIMENTO DELLA PROTEZIONE CIVILE (DPC) E ISTITUTO DI SCIENZE DELL'ATMOSFERA E DEL CLIMA CONSIGLIO NAZIONALE DELLE RICERCHE (CNR-ISAC) 2016 RELAZIONE FINALE, 2013.
13. Team NOWCASTING, 2009: Manuale utente e procedure operative. Prodotti di Osservazione Satellitare per Allerta Meteorologica" (PROSA) (pp. 16-17 e pp. 23,25).
14. Team NOWCASTING, 2009: Specifiche algoritmiche. Prodotti di Osservazione Satellitare per Allerta Meteorologica" (PROSA) (pp. 13-15).
15. Team NOWCASTING, 2009: Specifiche tecniche dei moduli del sistema. Prodotti di Osservazione Satellitare per Allerta Meteorologica" (PROSA) (pp. 25-29).
16. FLASH Team, 2009: Observations, Analysis and Modeling of Lightning Activity in Thunderstorms for use in Short Term Forecasting of Flash Floods (FLASH), 3st year report (WP3 pp. 7-9).
17. FLASH Team, 2008: Observations, Analysis and Modeling of Lightning Activity in Thunderstorms for use in Short Term Forecasting of Flash Floods (FLASH), 2st year report (WP3 pp. 20-23).
18. FLASH Team, 2007: Observations, Analysis and Modeling of Lightning Activity in Thunderstorms for use in Short Term Forecasting of Flash Floods (FLASH), 1st year report (WP3, pp. 5-9).