

THE SECOND INTERNATIONAL PRECIPITATION WORKING GROUP (IPWG) WORKSHOP

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The formation of the International Precipitation Working Group (IPWG) originated as a result of a recommendation put forth by the World Meteorological Organization (WMO), who had strongly encouraged the formation of IPWG with active participation by the WMO and the Global Precipitation Climatology Project (GPCP), within the framework of the Coordination Group for Meteorological Satellites (CGMS). In September 2002, the newly formed IPWG held its first meeting in Madrid, Spain, which was hosted by the National Meteorological Institute (INM) of Spain. The meeting was co-organized by Dr. Vincenzo Levizzani of the Institute of Atmospheric Science and Climate (ISAC), Bologna, Italy, and Dr. Arnold Gruber of the National Oceanic and Atmospheric Administration (NOAA) National Environmental Satellite and Information Service (NESDIS) of the United States.

Building upon the success of this initial workshop, the IPWG organized the second **Workshop on Precipitation Measurements** between October 25-28, 2004, in Monterey, California, United States. In these proceedings, we present all oral presentations, overview articles, and working group reports from this second (IPWG-2004) meeting. The IPWG-2004 meeting was co-organized by Dr. F. Joseph Turk of the Naval Research Laboratory (NRL) of the United States, and Dr. Peter Bauer of the European Centre for Medium-Range Weather Forecasts (ECMWF) in the United Kingdom. While the goals of the first meeting were more broadly aimed (surveying satellite-based rainfall estimation techniques, understanding related research efforts, and establishment of validation efforts), the goals for this second IPWG meeting were focused on four main topics. Specifically:

- 1) To obtain an update of operational and quasi-operational satellite-based estimates of precipitation for weather, hydrometeorological and climate applications, including the status of current and future satellite missions, both experimental and operational (TRMM, GPM, AMSR, DMSP, etc.).
- 2) To perform an in-depth analysis of the issues underlying precipitation retrievals, such as retrievals over complex terrain, frozen precipitation, hydrometeor characterization, vertical structure, etc.
- 3) To report on the analysis of the performance of current forecast models and satellite techniques over various seasons, rainfall regimes, and space-time scales (e.g., under what conditions do models outperform satellite?) and how they relate to the requirements and applications ranging from mesoscale to climate.
- 4) To update and further plan satellite and model precipitation validation and related activities.

The meeting which was hosted by the Naval Research Laboratory (NRL) Marine Meteorology Division (MMD) in Monterey, California. The opening address was given by Dr. Simon Chang, Superintendent, NRL-Monterey, where he stressed the importance of satellite observations of

clouds and precipitation to the models used by both civilian and Navy forecast models and their daily operations. The meeting was organized into four distinct sessions:

1. International Projects and Satellite Programs
2. Operationally-Oriented Precipitation Datasets
3. Validation and Error Analysis
4. Research Activities: Precipitation Characterization, Retrievals and Microphysics

After formal presentations, the meeting participants assembled into three distinct working groups: Operational Applications, Research Activities, and Validation Activities. The working group reports from the first IPWG meeting (2002 meeting in Spain) were reviewed, and action items reported on, updated, or (where appropriate) discarded. New action items were added as needed. Special presentations were given by Dr. Phil Arkin of the Earth System Science Interdisciplinary Center (ESSIC) at the University of Maryland, United States, who proposed the formation of a Program for the Evaluation of High Resolution Precipitation Products (PEHRPP), and Dr. Michael Goodman of the National Aeronautics and Space Administration (NASA), who proposed the establishment of precipitation dataset standards. The workshop occurred during the time of an assesment of the precipitation datasets being produced by the GPCP, and Dr. Arnold Gruber of the National Oceanic and Atmospheric Administration (NOAA) presented its current status and plans for completion.

This second meeting of the IPWG was made possible with gracious support from the Naval Research Laboratory, NOAA, EUMETSAT, and the World Meteorological Organization. Without their support, this meeting would have not been possible. Finally, we thank our fellow colleagues, with the hope that their dedication to the activities of the IPWG will lead to a better understanding of the Earth's precipitation and its role in the hydrological cycle.

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