



Precipitation Monitoring and Research Projects at the Meteorological Research Institute, Brazil

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The Meteorological Research Institute (IPMet) of the São Paulo State University (UNESP) is located at Bauru, in the central area of the State of São Paulo, Brazil, boasting more than 30 years of research activities, primarily dedicated to issues on precipitation. IPMet operates two S-band Doppler radars in Bauru (BRU, -22.3578; -49.0267) and Presidente Prudente (PPR, -22.1175; -51.3833) all year round in surveillance mode (0.3° PPI; 450 km range) and in volume scan mode (240 km, also recording radial velocities). A third system is planned to be installed shortly at Campinas (about 80 km northwest of the center of São Paulo). This network is operated routinely, providing nowcasting for the State and adjacent areas, with specific emphasis on alerts within the 240 km range. For this purpose, the TITAN Software has been installed in collaboration with NCAR and adjusted to suit the local conditions in the State of São Paulo. Research results are continuously transferred to operations, while operations provide validation and feedback to researchers.

Research projects presently being carried out include quantification of precipitation with radar, complemented by satellite, nowcasting of precipitation including initiation of convection and severe weather (including relatively rare tornadoes), precipitating systems and storms characteristics and climatology of echoes. Other research activities contemplate support to international programs as is the case of GPM validation, as well as participation in EU-driven projects, such as HIBISCUS and TROCCINOX through the Brazilian TroCCiBras (Tropical Convection and Cirrus Brasil) Project.

In this presentation original approaches to the scientific challenges, most recent results

and specific applications are discussed. Among the outstanding topics considered are the proper matching of measurements from different sources (e.g., radar, lightning networks, satellite and rain gages). For instance, lightning is used as indicator of storm development stage and evolution, convection initiation prediction is derived from convergence lines, VIL is used as a signature of storm severity and for issuing alerts, amongst others. Another topic is the climatologic characterization of flood prone areas.

Perspectives and plans for the research program close the presentation.