

Multi-sensor observation of precipitation in a coastal region of Antarctica

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In the framework of a Italian-French-Swiss collaboration, a suite of instruments dedicated to the observation of solid precipitation was deployed at the French Antarctic station Dumont d'Urville on the coast of Adélie Land in Antarctica during (southern) summer 2015-2016. On the remote sensing side, a depolarization lidar (531 nm), a 24-GHz vertical Doppler profiler (MRR from Metek) and a scanning X-band polarimetric radar (called MXPoI) were nearly collocated. For measurement at the ground level, a weather station (for local meteorological conditions), a weighing gauge (Pluvio2 from OTT, with wind shield), an optical disdrometer (Biral) and a multi-angle snowflake camera (MASC) were complementing the remote sensing instruments. In addition, daily radiosounding records collected by MeteoFrance were available.

This experimental set up was built in order to investigate the added value of remote sensing for the monitoring and understanding of Antarctic precipitation (variability, microphysics), as well as to collect reference data for the evaluation of satellite precipitation products derived from CloudSat and simulated from numerical prediction weather models. Moreover, the potential of radar measurement to distinguish blowing snow from precipitation, an acute problem in the windy coastal regions of Antarctica, was also investigated.

This contribution presents the motivation, the set-up and a first analysis of this unprecedented data set about Antarctic precipitation.