



The relation between airflow and precipitation over Taiwan and its potentialities for analogue-based nowcasting

Luca Panziera (1), Jim Wilson (2), and Rita Roberts (2)

(1) Department of Civil, Environmental and Mechanical Engineering, Atmospheric Physics Group, University of Trento, Italy,
(2) National Center for Atmospheric Research, Boulder, Colorado

The mountainous island of Taiwan is heavily affected by intense rainfall during both synoptic (Mei-Yu fronts) and typhoon precipitation events. This study demonstrates that there is a strong relation between speed and direction of mesoscale winds and the intensity and the distribution of precipitation over the island, and that this relation can be successfully exploited for short-term forecasting of rainfall based on meteorological analogues.

Previous studies demonstrated that nowcasting of orographic precipitation based on analogues performs better than Eulerian persistence and numerical weather prediction models over Southern Switzerland. In this work we show that this is a valid solution also for the island of Taiwan.

Mesoscale winds are estimated by means of Doppler velocity radar measurements, whereas radar-derived rain rates at the ground are used to characterize the precipitation field. A total of 163 days of precipitation during synoptic (Mei-Yu) cases and 130 days of rainfall during typhoon cases constitutes the historical archive in which the system searches for analogues. Forecasts are based on the rainfall observed by radar after the analogous situations.