



## **A midlatitude precipitating cloud database validated with satellite observations**

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The simulations of five midlatitude precipitating events by the non-hydrostatic mesoscale model Meso-NH are analyzed. These cases cover contrasted precipitation situations from 30 to 60°N, which are typical of midlatitudes. They include a frontal case with light precipitation over the Rhine area (10 February 2000), a long lasting precipitation event at Hoek van Holland (19 September 2001), a moderate rain case over the Elbe (12 August 2002), an intense rain case over Algiers (10 November 2001), and the 'millennium storm' in England (30 October 2000). The physically consistent hydrometeor and thermodynamic outputs are used to generate a database for cloud and precipitation retrievals. The hydrometeor vertical profiles generated vary mostly with the 0°C isotherm, located between 1 and 3 km height depending on the case. The characteristics of this midlatitude database are complementary to the GPROF database, which mostly concentrates on tropical situations.

The realism of the simulations is evaluated against satellite observations by comparing synthetic brightness temperatures (BTs) with Advanced Microwave Sounding Unit (AMSU), Special Sensor Microwave Imager (SSM/I), and METEOSAT observations. The good reproduction of the BT distributions by the model is exploited by calculating categorical scores for verification purposes. The comparison with three-hourly METEOSAT observations demonstrates the ability of the model to forecast the time evolution of the cloud cover, the latter being better predicted for the stratiform cases than for others. The comparison with AMSU-B measurements shows the skill of the

model to predict rainfall at correct location.