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Verification of precipitation forecasts by the DWD Limited Area Model LME over Cyprus

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A comparison is made between the precipitation forecasts by the non-hydrostatic limited area model LME of the German Weather Service (DWD) and observations from rain gauges located around two synoptic stations in Cyprus. This is a first attempt to carry out a preliminary verification and evaluation of the LME precipitation forecasts over the area of Cyprus.

The boundary data for the LME are provided by the operational global model GME every hour. The horizontal resolution of the LME is 7km (0.0625˚), while the atmosphere is represented with forty layers in the vertical, ten of which resolving the boundary layer structure. The LME covers the whole European region, including the Mediterranean, Black, North and Baltic Seas. For the purpose of this study, a subarea was chosen, which extents from 20˚E, 30˚N to 37˚E, 40˚N.

For the verification, model forecasts and observations were used covering an eleven-month period, from 1/2/2005 till 31/12/2005. The observations were made by two Automatic Weather Observation Systems (AWOS) located at Larnaka airport (33.37˚E, 34.52˚N) and Paphos airport (32.49˚E, 34.72˚N), as well as 6 and 8 rain gauges within a radius of about 30km around these airports, respectively. The observations were compared separately with the T+0, T+24, T+48 and T+72 model outputs.

The ‘probability of detection’ (POD) of a precipitation event and the ‘false alarm rate’ (FAR) were calculated. From the selected cases of precipitation events, the average and maximum forecast precipitation amounts in the area around the two stations were compared with the measured ones. In addition, a categorical comparison was carried

out.

An attempt was also made to evaluate the model's skill in predicting the spatial distribution of precipitation and, in this respect, the geographical position of the maximum forecast precipitation amount was contrasted to the position of the corresponding observed maximum. Finally, maps with monthly precipitation totals observed by a local network of 150 rain gauges were compared with the corresponding forecast precipitation maps.