Geophysical Research Abstracts, Vol. 9, 01300, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-01300

Sensitivity of rainstorms in Central Mediterranean Basin to upper level forcing: a case study

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This study investigates the sensitivity of a moderate-intense storm that occurred over Calabria, southern Italy, to the upper level forcing through a Potential Vorticity (PV) perspective. A prominent mid-troposheric trough can be identified for this event which serves as the precursor agent for the moderate-intense precipitation recorded.

The work hypothesis is that the uncertainty in the representation of the upper-level disturbance has a major impact on the precipitation forecast and we cope with this issue by selecting five different scenarios in a Limited area model Ensemble Prediction System (LEPS) framework which utilizes the height of the dynamical tropopause as the discriminating variable. Pseudo water vapour images of different scenarios are compared to the corresponding METEOSAT 7 water vapour image at a specific time, antecedent to the rain occurrence over Calabria, in order to evaluate the reliability of the different precipitation scenarios simulated by the LEPS.

The work hypothesis is then verified in the second part of the work were the impact of the upper level forcing for this event is discussed using the PV inversion property.