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The use of the vertical thermodynamic data in the quantitative precipitation forecasting in Catalonia (Spain) from an analogues technique for the period 1951-2004

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The objective of this presentation is to present an improvement of quantitative forecasting of daily rainfall in Catalonia (NE Spain) from an analogous technique, taking into account synoptic and local data. This method is based on an analogous sorting technique: meteorological situations similar to the current one, in terms of the 850 and 1000 hPa geopotential fields at 12 UTC from NCEP/NCAR meteorological reanalyses, and some thermodynamic parameters are extracted from a historical data file. The period analysed comprises 1951-2004 with special incidence in some heavy rainfall events contemplated in the framework of the AMPHORE project. Thermodynamic analysis acts as a highly discriminating feature for situations in which the synoptic situation doesn't offer a complete explanation either of the atmospheric phenomena or of rainfall distribution. This is the case in heavy rainfall situations, where the existence of instability and a high content of water vapour are essential. With the objective of including the vertical thermodynamic features, information provided by the Palma de Mallorca radiosonde (Spain) has been used. Previously, a selection of the most discriminating parameters for the daily rainfall was made, and the technique of the analogues then applied to them. Finally, the analogues method was applied to the synoptic data combined with the vertical thermodynamic data. Results show a substantial improvement with this last method.