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Radar adjusted data versus modelled precipitation: a case study over Cyprus

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Abstract. In the framework of the European VOLTAIRE project (Fifth Framework Programme), simulations of relatively heavy precipitation events, which occurred over the island of Cyprus, by means of numerical atmospheric models were performed. One of the aims of the project was indeed the comparison of modelled rainfall fields with multi-sensor observations. Thus, for the 5 March 2003 event, the 24-h accumulated precipitation BOlogna Limited Area Model (BOLAM) forecast was compared with the available observations reconstructed from ground-based radar data and estimated by rain gauge data.

Since radar data may be affected by errors depending on the distance from the radar, these data could be range-adjusted by using other sensors. In this case, the Precipitation Radar aboard the Tropical Rainfall Measuring Mission (TRMM) satellite was used to adjust the ground-based radar data with a two-parameter scheme. Thus, in this work, two observational fields were employed: the rain gauge gridded analysis and the observational analysis obtained by merging the range-adjusted radar and rain gauge fields.

In order to verify the modelled precipitation, both non-parametric skill scores and the contiguous rain area (CRA) analysis were applied. Skill score results show some differences when using the two observational fields. CRA results are instead quite in agreement, showing that in general a 0.27° eastward shift optimizes the forecast with respect to the two observational analyses. This result is also supported by a subjective inspection of the shifted forecast field, whose gross features agree with the analysis pattern more than the non-shifted forecast one.

However, some open questions, especially regarding the effect of other range adjustment techniques, remain open and need to be addressed in future works.

Full Article in PDF (PDF, 634 KB)

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