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Assessing the impact of Multiple Doppler Radar data assimilation using WRF-3DVAR on a Heavy Precipitation Event of the HyMeX campaign

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An analysis to evaluate the impact of assimilating multiple radar data with a three dimensional variational (3D-Var) system on a heavy precipitation event is presented.
During the first Special Observation Period (SOP1) of HyMeX (Hydrological cycle in the Mediterranean Experiment) campaign several Intensive Observing Periods (IOPs) were launched and nine occurred in Italy. Among them IOP4 was chosen for this study because of its low predictability. The event hit central Italy (CI) on 14 September 2012 producing heavy precipitation and causing several damages. Data taken from three C-band radars running operationally during the event have been assimilated to improve high resolution Initial Conditions (IC). To the aim of evaluate the effect of different horizontal resolution on the assimilation procedure and to assess the impact of assimilating multiple radars data, several experiments using Weather Research and Forecasting (WRF) model are performed. Finally, a statistical evaluation is performed comparing the results for different indices as equitable threat score (ETS), false alarm ratio (FAR) and frequency bias (FBIAS).