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Impact of radar data assimilation on WRF simulations of the Aniene flood

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A study of the Aniene flood, in the urban area of Rome, is performed using Monte Midia Radar data to improve high resolution initial conditions. The radar site is at the border between the Abruzzo and Lazio regions in Central Italy. Mt. Midia top height is at 1760 m and covering most Central Italy, including the urban area of Rome.
Aniene flood occurred during May 20-22, 2008 causing severe damages. The meteorological structure was characterized by a deep cyclone impinging on the Tyrrhenian sea for almost two days. During the event duration Radar detected either local convection northern of Rome and moderate rain east of Rome lasting for several hours. The WRFV3 model at high resolution has been used to simulate the event, and radar data has been assimilated using 3DVAR to the aim of improving the Initial Conditions. Sensitivity tests to different set of Initial Conditions are performed using either ECMWF analyses and 'warm start'. To objectively identify the best IC statistical indicators are used as FBIAS, RMS and EQTS for the accumulated precipitation. The results clearly show a good model ability in reproducing local convection if a warm start is used, whereas the large scale precipitation is better reproduced if ECMWF analyses are used.