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High resolution simulations of extreme weather event in south Sardinia

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In the last decade, like most region of Mediterranean Europe, Sardinia has experienced severe precipitation events generating flash floods resulting in loss of lives and large economic damage. A numerical meteorological operational set-up is applied in the local weather service with the aim to improve the operational short range weather forecast of the Service with particular attention to intense, mostly rare and potentially severe, events. On the early hours of 22 October 2008 an intense and almost stationary mesoscale convective system interested particularly the south of Sardinia, heavy precipitation caused a flash flood with fatalities and numerous property damages. The event was particularly intense: about 400 mm of rain in 12 hours (a peak of 150 mm in an hour) were misured by the regional network of weather stations and these values appear extremely meaningfulls since those are about seven times the climatological monthly rainfall for that area and nearly the climatological annual rainfall. With the aim to improve significantly quantitative precipitation forecasting, it was evaluated a different set-up of a high resolution convection resolving model (MM5) initialised with different initial and boundary conditions (ECMWF and NCAR). In this paper it is discussed the meteorological system related to the mentioned event by using different numerical weather models (GCM and LAM) combined with conventional data, radar Doppler and Meteosat images. Preliminary results say that a different set-up of a non hydrostatic model can forecast severe convection events in advance of about one day and produce more realistic rainfall than that current operational and also improve the weather forecasts to respect the ECMWF-GCM. So it could drive an operational alert system in order to limit the risks associated with heavy precipitation events.