

Triggering of a deep convective system in the Mediterranean Sea: modelling and observations at a very fine scale.

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Four different events, with severe rainfall downpours and localized flash flooding, occurred recently over the Liguria region in the fall season, between 2010 and 2014. In all cases the formation of a quasi-stationary mesoscale convective system, producing a steady back-building process on the Ligurian Sea, was observed.

The most recent event of Genoa 2014 is taken as paradigmatic for the sequence of disastrous floods along the Gulf of Genoa during last years. It is studied with two cloud resolving grid spacing WRF model set up, namely 1000 and 200 meters.

The process was already described by Lin et al. (2005) as a “...strong, stable layer over the Ligurian Sea (which) behaved as an effective mountain, such that the incident low-level air from the south was lifted up and over the stable layer as though being lifted over terrain”.

Indeed the results of the 200 meters analysis allow explaining the triggering mechanisms of this kind of convective events, actually hardly predictable by operative numerical weather prediction models.

The availability of the petascale computing services provided by the EU funded DRIHM project enabled such massive computing effort.

Lin YL., Reeves HD, Chen SY, Chiao S. 2005. Formation mechanisms for convection over the Ligurian Sea during MAP IOP-8. *Monthly weather review*. 133(8), 2227-2245.