



Extreme characteristics of the 4 november 1966 storm over Italy

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On 4 November 1966 a storm hit northern and central Italy and produced severe damages in Tuscany, in the north-eastern Alps and in the venetian-friuli plane. The intense and persistent precipitation caused landslides in the mountain area and flooding of many towns (Florence and Trento are the most well known cases) and of the countryside surrounding them, and the intense sirocco wind produced very high waves in the northern Adriatic Sea and the highest ever recorded surge in Venice. The loss in terms of economic and artistic goods was huge. The exceptionality of this event has been evaluated by considering the time serie of the cyclone pressure minimum, the precipitation field and the surge. In order to evaluate the return times associated to the intense precipitation, a statistical analysis of the extreme values at several stations of northern and central Italy has been performed. The event has been reconstructed with the regional atmospheric model BOLAM. Simulations have been performed using two different sets of initial and boundary conditions extracted from the NCEP and ERA-40 reanalysis respectively. When NCEP data are used the simulated trajectory of the cyclone and the SLP and precipitation fields agree satisfactorily with observations. If ERA-40 data are used the results show significant differences with observations in the trajectory of the cyclone and in the SLP field. Correspondingly, significant differences among the two reanalysis in the synoptic situation associated to the event are evident from the potential vorticity fields. The role of convection has been studied by comparing the results of two simulations in which convective processes have been described by different numerical schemes. Differences are found to be less significant, showing that the role of initial and boundary conditions is more important than the internal physics of the model for the correct reproduction of this event.