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An EF3 multi-vortex tornado over southern Italy: a retrospective analysis by means of observations, pictures and videos

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The possibility offered by the internet to post and share pictures of tornadoes has made it apparent that their occurrence over Europe has been largely underestimated. Together with weak waterspouts and tornadoes, large and intense vortices are occasionally observed. Among these, an EF3 multi-vortex tornado, with a horizontal extent of some hundreds of meters near the ground affected southeastern Italy on 28 November 2012, causing one casualty and estimated damage of 60 M€ to the largest steel plant in Europe. A tide gauge positioned near the location of tornado landfall and a vertical atmospheric profile available a few hours later near the affected region represent unique sources of information for this kind of event in the Mediterranean. During its transit across the port of Taranto, a waterspout, which was to become the tornado, was observed to have induced a sea-level rise of about 30 cm. The supercell responsible for the tornado developed from convective cells triggered by orographic uplift over the Apennines. The wind shear between the ground and 1 km height was exceptional in comparison with other Italian tornadoes, and was remarkable in comparison with US events as well. Other indices for severe convection diagnosis, such as the Energy Helicity Index and Storm Relative Helicity, also showed extremely high values. Photos and videos show the presence of a multi-vortex structure during the most intense phase, with the presence of some minor vortices around the main structure. The repetitiveness of waterspouts in the same area, although of smaller intensity and dimension, is finally discussed.