Geophysical Research Abstracts
Vol. 14, EGU2012-8647, 2012
EGU General Assembly 2012

Cloud-permitting simulation of the torrential rainfall event in Genoa (Liguria, Italy) on November 4th, 2011

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The city of Genoa, which nestles between the Tyrrhenian sea and the Apennine mountains (Liguria, Italy) was rocked by severe flash floods on 4th November 2011. About 500 millimeters of rain - a third of the average annual rainfall - fell in six hours. Six people were killed. The raging waters uprooted trees, swept cars, shattered shops and flooded the town center.
The synoptic-scale meteorological system, which was responsible for the Genoa flash flood, raged from West Virginia to Maine from 29th until 30th October and was blamed for at least 13 deaths. It moved across the Atlantic Ocean, generated floods that killed 5 people in Southern France, and finally it arrived over the Liguria sea and produced the severe rainfall, which we present here.
Cloud-permitting simulations (1 km) of the finger-like convective system responsible for this torrential event over Genoa have been performed using Advanced Research Weather and Forecasting Model (ARW-WRF, version 3.2.1).
Two different microphysics (WSM6 and Thompson) as well as three different convection closures (explicit, Kain-Fritsch, and Betts-Miller-Janjic) have been combined to gain a deeper understanding of the physical processes underlying the observed torrential event. Comparison between modeling findings and observed fields provided by raingauge data, satellite data, and radar data have undertaken.
The paper presents the results and gathers conclusions.