Combining Satellite, Radar and NWP data for severe convection
Nowcasting over the Alpine area

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The main goal of the COALITION project is the onset of a heuristic object-oriented model aimed to improve the forecast and warning of severe thunderstorms. This is achieved providing real-time probabilistic information about the evolution of convective cells detected from its early stage.

This paper proposes an innovative methodology, where the best available information on convective processes provided by different sources (Meteosat Second Generation, Radar Nowcasting Products and Numerical Weather Prediction models) is combined in order to increase the lead time in forecasting severe convective events. The COALITION algorithm merges evolving thunderstorm attributes (predictants, e.g. Cloud Top Temperature, Radar based Vertical Integrated Liquid content) with severe convection predictors (environmental parameters). The storm evolution is the result of the interactions between convective signatures (objects) and the surrounding environment, which are, described into a simplified one-dimensional Hamiltonian model.

In a complex terrain like the alpine area, the orographic forcing plays an important role. This factor has therefore been included in the system as a possible convection trigger.

In this paper the methodology and the results of this EUMETSAT Fellowship project are presented and discussed. A preliminary statistical assessment based on a set of fifty different thunderstorm events is also reported.