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## Conference on European Tomadoes and Severe Storms

## Modelling of severe precipitation events in North-Eastern Italy

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The North of Italy, and in particular the region of Friuli, is known for its devastating and repeated hail falls causing much damage to the agricultural community (Morgan, 1973).

At the research centre of *Cervignano del Friuli* in North Italy, where much research on hail falls have been conducted over the past decades, a large experimental measurement campaign is planned with the aim to test if modern cloud seeding techniques induce a modification of precipitation patterns of individual thunderstorms as compared to non-treated clouds.

The present work was aimed at preparing the basis for such campaigns and describes different numerical simulations of a precipitating convective system in the region of Friuli in North Italy using a three-dimensional, non-hydrostatic cloud physics model (e.g., Clark, 1979; Clark et al, 1997).

The aim of this study was to show that the spectral hail module developed by Farley and Orville (1986) has been successfully implanted into the three-dimensional version of the Clark model. The spectral module discretises the precipitating ice phase into 20 different ice categories ranging from 100  $\mu$ m to 5 cm in diameter. In a general way the overall development of the convection in the Friuli region as compared to the bulk simulations is assessed. Further, the development of one particular convective cell is described in detail with regard to hail.

Compared to the bulk run the spectral simulation shows qualitatively a similar distribution of the precipitation fields for the onset of the convection. Quantitatively the hail falls appear to be higher, in particular at the surface.

Overall, the spectral parameterisation allows to analyse the development of hail falls with regard to the different hail classes and to draw conclusions about the maturing process of the convective cells. In order to draw conclusions about the reliability of the spectral model results, most of all with regard to the quantity of rain- and hail fluxes and consequently also to the accumulation of hail and the number of impacts at the surface (hailpad counts), a detailed comparison with observational data has to be performed.