

Nowcasting of thunderstorms and severe convection in Switzerland

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Hail, lightning and flash floods are the dangers associated with thunderstorms. In Switzerland between 1972 and 2007 these damages summed up to 1850 million Euro. Additionally, life threatening situations dangerous for health or life may occur, in particular in mountainous areas. Warnings based on nowcasting are an essential mean to protect lives and reduce these costs.

In this talk we present the nowcasting algorithm **Context and Scale Oriented Thunderstorm Satellite Predictors Development (COALITION) Second Generation (SG)** developed by MeteoSwiss. The overall goal of COALITION SG is to identify, track and nowcast the development of convectively active regions as accurately as possible in a continuous and robust manner. The algorithm has an update cycle of 5 min and a spatial resolution of 1 km. And the forecast area is Switzerland and its adjacent regions. COALITION SG is one of the few nowcasting systems making use of a wide range of different input data set: observations and derived products from MSG SEVIRI, the Swiss dual-polarization Doppler weather radar network and the Météorage lightning observation network as well as COSMO forecasts. We discuss the COALITION SG nowcasting algorithm that can be divided into four major steps: 1. The cloud motion is estimated based on the HRW products of the NWC-SAF. 2. Convectively active regions and thunderstorms are identified and their convective development is predicted. In the early development of the thunderstorm, only satellite observations and NWP forecasts are available. To identify rapidly developing cumulus clouds that may develop into severe thunderstorms satellite brightness temperatures (BT), BT differences and temporal trends of BTs as predictors for updraft strength, cloud thickness and cloud top glaciation. In the mature stage of the thunderstorm, radar and lightning observations complement the satellite observations. 3. The future position of strong thunderstorms is predicted using Lagrangian extrapolation. 4. The results are then visualized in an intuitively understandable way to optimally support the forecaster. The forecasting procedure of COALITION SG is illustrated with case studies.