



## **Severe Convection in the Alpine region: a radar based hail climatology.**

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During the convective season, intense thunderstorms regularly affect the Alpine area, causing substantial damage to agriculture, forest, buildings, cars and infrastructure. In Switzerland, severe summer storms belong to the costliest high-impact weather events. Therefore, a deeper knowledge of the dynamics and the physics of these phenomena as well as of their interaction with the complex orography is required. The hail-project, a collaboration between the University of Bern and MeteoSwiss, focusses on hailstorms over the Swiss Alpine and pre-Alpine area. Two radar-based hail detection products, namely the Probability Of Hail (POH) and the Maximal Expected Severe Hail Size (MESHS), have been reprocessed for the extended convective season (April-September) between 2002 and 2014. The hail products computation is based on high quality data provided by the Swiss weather radar network as well as on the Swiss regional numerical model COSMO. The result is a comprehensive radar-based hail map, which highlights regional and macro-regional differences considering different temporal scales. Seasonal and monthly variability of hail occurrence as well as the diurnal cycle are analyzed. Furthermore, meteorological conditions leading to hailstorms over different regions are investigated using the weather-type classification provided by MeteoSwiss. The results are discussed considering the challenges of using radar-based hail products over complex terrain.