# Tracking hailswaths on radar data between 2002 and 2016: a new perspective for climatological studies of hail in the Alps.

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Recently hail climatologies have been created and analysed in several countries using different data sources (mainly hailpads, weather radars, insurance- and crowd-sourcing data). Spatial and temporal distribution of hail are often provided with gridded datasets. In this study a thunderstorm tracking algorithm is applied on a large, homogeneous radar archive (1km - 5 min resolution) containing data over Switzerland and surrounding areas between 2002 and 2016. The introduction of an "object-based" perspective allows new knowledge on hailstorms and their characteristics. Storm paths are recomputed resulting in a new database consisting of more than one million cells-trajectories and several thousand severe hailswaths. Robust statistics provide new information about storm- and hailswath initiations, lifecycles, geometrical characteristics and their relation with orography. Yearly distributions and trends as well as the seasonal- and the diurnal-cycle of hail cells are discussed. A weather type classification is used to cluster hail initiations and typical paths over the Alps. Furthermore, by adding information from lightning networks the co-occurrence of lightning jumps and hail is presented. Finally, the potential of these new statistical outcomes for future severe thunderstorm nowcasting applications is also briefly discussed.