



Hailstorms over Switzerland: Verification of Crowd-sourced Data

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The reports of smartphone users, witnessing hailstorms, can be used as source of independent, ground-based observation data on ground-reaching hailstorms with high temporal and spatial resolution. The presented work focuses on the verification of crowd-sourced data collected over Switzerland with the help of a smartphone application recently developed by MeteoSwiss. The precise location, time of hail precipitation and the hailstone size are included in the crowd-sourced data, assessed on the basis of the weather radar data of MeteoSwiss. Two radar-based hail detection algorithms, POH (Probability of Hail) and MESHS (Maximum Expected Severe Hail Size), in use at MeteoSwiss are confronted with the crowd-sourced data. The available data and investigation time period last from June to August 2015. Filter criteria have been applied in order to remove false reports from the crowd-sourced data. Neighborhood methods have been introduced to reduce the uncertainties which result from spatial and temporal biases. The crowd-sourced and radar data are converted into binary sequences according to previously set thresholds, allowing for using a categorical verification. Verification scores (e.g. hit rate) are then calculated from a 2x2 contingency table. The hail reporting activity and patterns corresponding to "hail" and "no hail" reports, sent from smartphones, have been analyzed. The relationship between the reported hailstone sizes and both radar-based hail detection algorithms have been investigated.