How radar can be supported by gravimeters for estimating hail intensity

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Underground superconducting and spring gravimeters at the research stations of Rochefort (BE), Walferdange (LU) and Membach (BE) integrate soil water in a radius of about 200 m around the instrument. This allows measuring rainfall with a precision of a few nm/s²; 1 nm/s² corresponding to 2.4 mm of water. In this study, we compare the amount of precipitation as monitored by the underground gravimeters with the observation of the C-band weather radar in Wideumont, 85, 33 and 54 km away. The results are also compared with rain gauges co-located with the gravimeters. The focus is given to hail fall events with large precipitation amounts over short durations. The added value of gravimeter measurements is particularly high since the quality of radar and raingauge precipitation estimates in such cases is known to be relatively poor.

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