



A New Instrument for High-Speed, High Resolution Stereoscopic Photography of Falling Hydrometeors with Simultaneous Measurement of Fallspeed



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 "Howie" Alta Ski Area

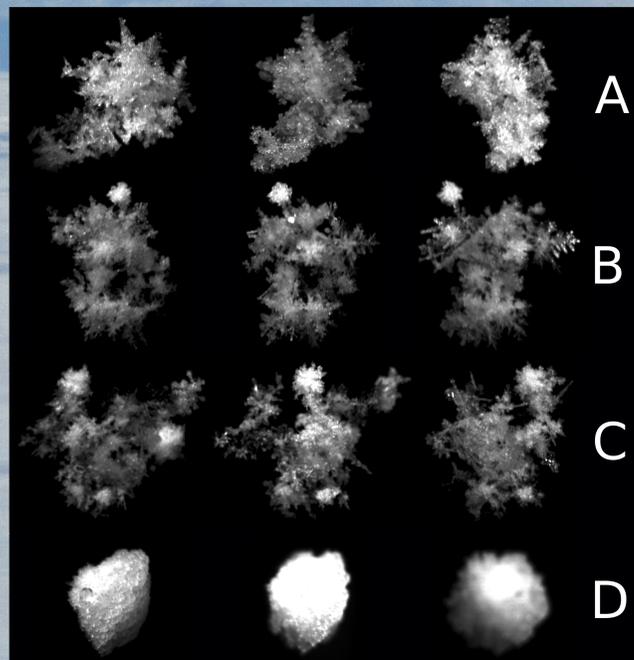
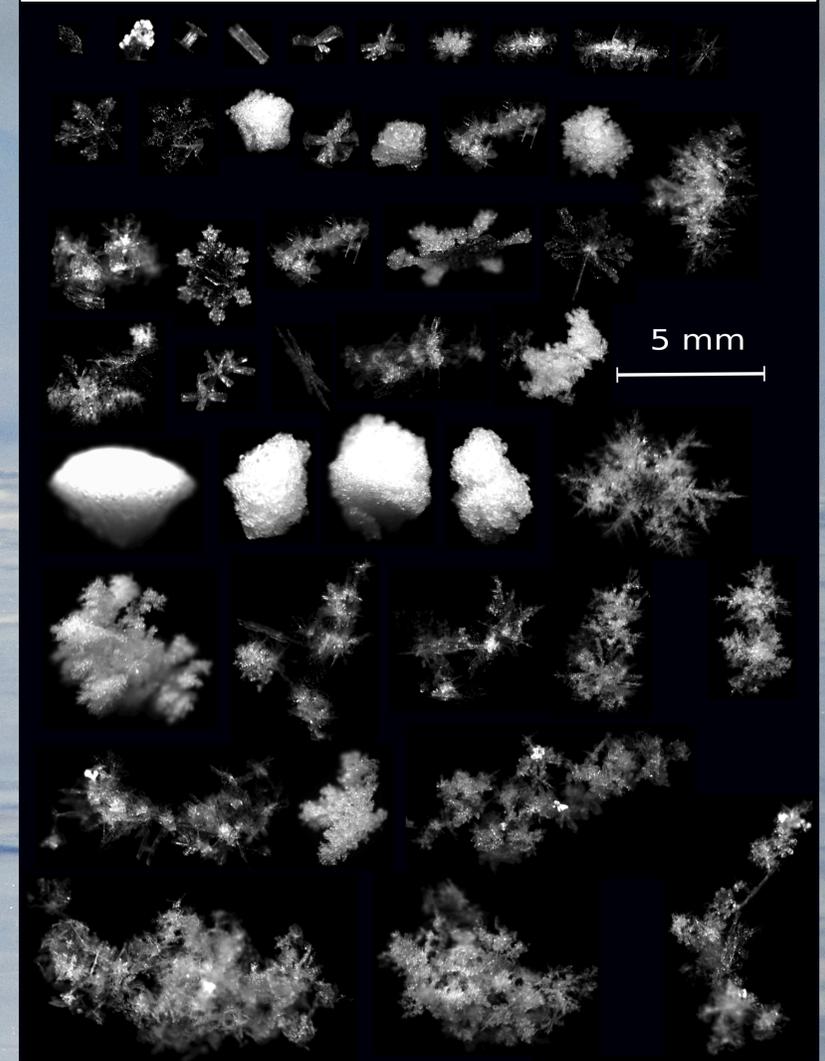
Sandra Yuter, Nate Hardin, Jennifer Dean, North Carolina State University

The *Fallgatter Technologies* Multi-Angle Snowflake Camera (MASC) provides up to 9 micron resolution stereoscopic photographic images of individual falling hydrometeors along with their fallspeed. The MASC uses a sensitive IR motion sensor for a trigger and photographs the particle surface from multiple angles. By comparison, the Joanneum Research 2DVD provides only 200 micron resolution silhouettes, making habit identification hard to impossible.

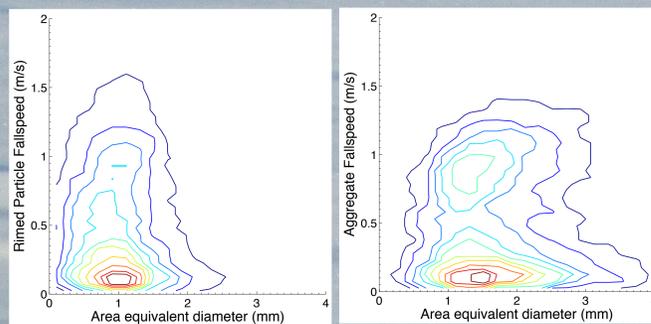
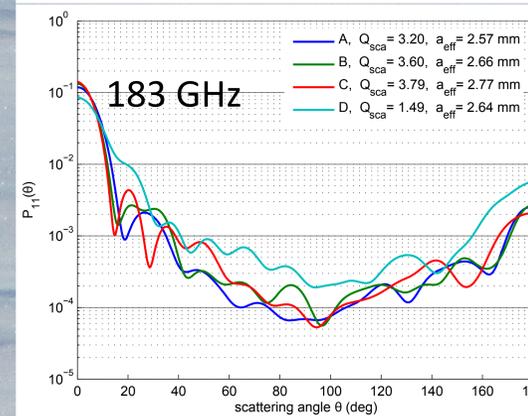
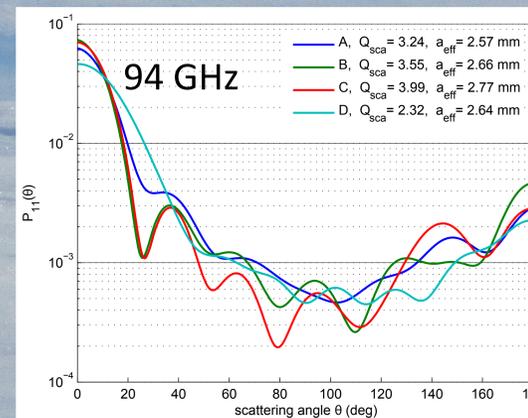
The potential of the MASC is for improved calculations of the relationships between hydrometeor microwave scattering properties and their microphysical and fallspeed properties. This past winter, we deployed two MASCs, an FSSP-100, meteorological instrumentation and a vertically pointing MicroRainRadar to Alta Ski Area near Salt Lake City. This poster shows hydrometeor statistics and microwave scattering calculations based on the data obtained between February and April, 2012.



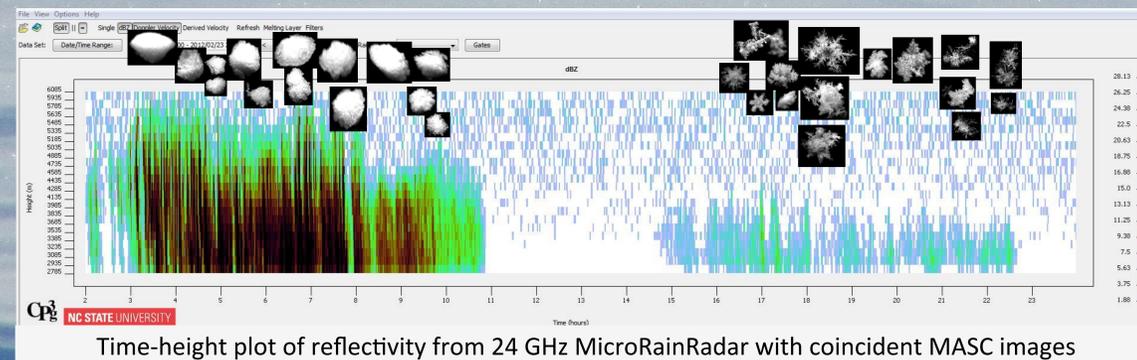
MASC images, each in triplet with a fallspeed



Discrete Dipole Approximation calculations at 94 GHz, at right, averaged over the triplet views for hydrometeors A to D shown above.



Above: Fallspeed versus area-equivalent-diameter frequency contours for aggregated and rimed particles. Why the small fallspeed mode? Modification by turbulence? There was no windscreen.



2DVD orthogonal images with fallspeed

