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.

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.

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

MASC images, each in triplet with a fallspeed

2DVD orthogonal images with fallspeed

Time-height plot of reflectivity from 24 GHz MicroRainRadar with coincident MASC images