

An Analysis of Vertical Radar Data and Precipitation Size Distributions during Winter Weather Events in Upper Michigan

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Since January 2014, a Micro Rain Radar (MRR) and Precipitation Imaging Package (PIP) have collected data of vertical reflectivity and precipitation size distributions, respectively, at the National Weather Service Office in Marquette, MI. The data has been gathered by the Space Science and Engineering Center (SSEC) at the University of Wisconsin-Madison as part of a study on snowflake microphysics in shallow snowfall cases. The MRR has proven useful as a supplement to the WSR-88D and surface observations for understanding mesoscale environments during precipitation. Meanwhile, the PIP has provided a wealth of information for lake effect snow ratio research.

Data collected from three events during the 2014-2015 winter season are presented. The cases include a synoptic to lake effect snow transition, a high snow-to-liquid ratio (>50:1) snowfall, and a transition from freezing rain to heavy snow. Operational applications of the data for real-time forecasting, the benefit of the data for lake effect snow ratio research, and several additional applications will also be discussed.