1.35 LINKING SNOWFALL MICROPHYSICAL PROPERTIES AND WATER CONTENT USING A MASC, A 2DVD AND A PLUVIO

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The quantification of solid precipitation is known to be a challenging task for the meteorological community. The variety of snowflake types and related physical properties (rimed, wet, dry) lead to different densities and the link between the physical properties and water content remains poorly known. In this context, a field campaign involving three collocated instruments was conducted at a mountainous site near Davos, Switzerland: a Multi-Angle Snowflake Camera (MASC), a 2D Video-Disdrometer (2DVD) and an OTT Pluvio2 weighing gauge were installed within a WMO Double Fence International Reference (DFIR). This study takes advantage of this unique instrumental set-up. The MASC and the 2DVD both take images of falling snowflakes, which provides information on the microstructural properties of the particles (i.e. size and fall velocity), while the Pluvio2 gives a direct measurement of the snowfall liquid water equivalent. In addition, an algorithm developed for MASC images gives crucial additional information on snowflake types and their degree of riming. As a first step, the similarity between the particle size distribution (PSD) from the MASC and the 2DVD is evaluated. For this purpose, and because the two sensors are different and have both encountered operational issues, the data were thoroughly checked and cleaned using different methods and sensitivity tests to provide comprehensive and reliable datasets in order to compare their PSD in the best conditions. Results derived over 35 snow events show that the PSD of MASC and 2DVD instruments are in good agreement. The 2DVD has a bigger measurement area than the MASC, allowing for a largeer particle sample.

The next step is the analysis of the links between liquid water equivalent precipitation rate measured by the Pluvio2 and the PSD measured by the 2DVD conditional on the hydrometeor types and riming degree estimated from MASC images, in order to better characterize solid precipitation.