Ground-based in-situ snowfall speed measurements

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Accurate knowledge of atmospheric snow particles' (ice crystals and particles) microphysical properties (area, size, shape and fall speed) is required for meteorological forecast and climate models, and also for their improvement, for instance, in form of parameterizations. In this work, we present measurements from a new ground-based dual-imager instrument that takes high-resolution side- and top-view images of individual snow particles in Kiruna (Sweden). Size, area, and fall speed of the snow particles are determined from the images and they are classified in needles, columns and bullets, plates, stellars, bullet rosettes, graupel, irregular shapes, and also ice and water droplets. In addition, we analyse the relationships between these microphysical properties. We show results from several snowfall events in Kiruna from 2014 to the present.