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Measurements of blowing snow : size distribution of snow particles at Lac blanc pass, French Alps.

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Wind-transported snow is a common phenomenon in French Alps, creating snowdrifts and contributing significantly to the loading of avalanche release areas. Some studies have already been conducted to address the size distribution of snow particles at a given height (Budd (1966), Schmidt (1982), Nishimura and Nemoto (2005), Gordon and Taylor (2009)). Such data could depend on topography and snow type and all of these studies have been conducted under different conditions than those encountered in the Alps.
Consequently, the present study was carried out at the Lac Blanc Pass (2700 m) experimental site in the French Alps using three snow particle counter set up at different height. Such optical devices are able to detect particles between 20 and 500 μm in mean radius size particle, divides them into 32 classes.
In the main cases and as usual, the size distribution of snow particles is represented by a gamma density function. During winter 2010-2011, the shape parameter α and the mean particle diameter were studied as function of height, friction velocity and snow type and the results were compared with previous studies.
Nevertheless, near the ground and with fresh snow, snow particle size distribution that differed from the two-parameter gamma distribution could also be observed. Such distribution has never been reported in the literature but seems to be similar to frequency distribution resulting from abrasion, which is a key process responsible for grain size fining due to friction and collisions that occur between the particles and the bed, reducing the size of each particle.