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Drifting snow measurements over an instrumented mountainous site : comparison of different devices

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Wind-transported snow is a common phenomenon in cold windy areas such as mountainous and polar regions. The wind erodes snow from high wind speed areas and deposits it in low wind speed areas. The resulting snowdrifts often cause problems for infrastructure and road maintenance and contributes significantly to the loading of the avalanche release area. Even if numerical models help predict and control drift patterns, accurate evaluations of the input parameters are needed for these numerical models to remain an open question. Blowing snow mass fluxes and wind profiles are mainly obtained from empirical relations. As the topography and type of snow could be quite different from one place to another, further experimental research is needed before using such formulae. Instruments were set up on our experimental site Col Du Lac Blanc (2700 m) in the Alps to obtain the required data (roughness, friction speed, threshold friction speed, drifting snow mass fluxes). These instruments include: specific optical instruments (Snow particle counter and present weather sensor PWS100), acoustic instruments (Flowcapt), 10 meter-mast with 6 anemometers, 3 temperature sensors and a depth sensor. New data obtained during winter 2008-2009 are compared with empirical formulae and past experimental data. A series of well documented events were back analysed by the numerical model proposed in (Naaim et al. 1998). Back analysis allowed to calibrate the Schmidt number and the erosion-deposition model parameters according to the snow properties.