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Current challenges in optical remote sensing of snow

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Snow optical reflectance varies mainly from snow physical and chemical properties. Optical measurements made from either airborne, space based and in situ sensors of snow reflectance are thus useful to monitor the evolution of the snow optical properties. However, for every type of measurement, specific challenges arise either to relate the measured signal to snow physical or chemical properties or to use the measured data directly in combination with snow models with assimilation techniques. These challenges are linked to the measurements methodology, their spatial, spectral and angular resolution and the radiative transfer model used in the retrieval. This talk will provide an overview of these challenges and a brief review of the different algorithms used for such retrieval with emphasis on the issues linked with complex terrains. In this respect, data obtained from satellite and in situ spectrometers at Col du Lautaret, 2100 m a.s.l, French Alps, are compared to in situ measurements of snow physical and chemical properties during the 2016/17 snow season.