Category
CR Cryosphere

Session Number
CR-7

Session Title
Snow and firn: an open measurement and modeling challenge

Session Description
Snow and firn are considered a major uncertainty in the knowledge of the global water and energy budgets. Both are critical components of the Earth ecosystem, very sensitive to climate change and the cause of numerous climate feedbacks. Continuous monitoring of snow and firn using remote sensing or ground-based techniques is challenging due to rapid variations in the proportion of the three contributing components ice, water and air, and the respective changes in energy budgets. The interaction of snow and firn with electromagnetic waves, underlying the retrieval for most remote sensing data, requires a detailed characterization ranging from microstructure to topographic scales. The modeling of snow and firn is often hampered by the lack of accurate treatment of some key physical processes such as water percolation, vapor transport, and snow metamorphism, and by uncertainties on the phase and occurrence of precipitation.
We invite contributions in modeling/observational experiments and instrumental developments that advance the understanding of snow and firn. We welcome studies that focus on key physical processes in snow and firn such as, but not limited to, radiative transfer, heat transport, gas and liquid flow, compaction, snow metamorphism, and interactions with vegetation. We also invite presentations about the application of observations and/or modeling to estimate snow surface energy budget, snow mass budget, and changes in snow cover and snowfall.

Keywords: seasonal and perennial snow, firn, in situ, remote sensing, observations, modeling, instrumental development, snow microstructure, water percolation, vapor transport, heat transport, radiative transfer, snow metamorphism, snow surface energy budget, snow mass budget, snow cover changes, snowfall

Lead Convener: Roberta Pirazzini
Email: roberta.pirazzini@fmi.fi
Affiliation lead-convener: Finnish Meteorological Institute, Finland

Co-convener 1: Achim Heilig
Email: heilig@r-hm.de
Affiliation: Munich University, Germany

Co-convener 2: Henning Loewe
Email: loewe@slf.ch
Affiliation: WSL Institute for Snow and Avalanche Research SLF, Switzerland

Co-convener 3: Marie Dumont
Email: marie.dumont@meteo.fr
Affiliation: Météo-France/CNRS, France