



Project acronym: HEFEX II

Project title: Hintereisferner Experiment II: Multi-Scale Ice-Atmosphere Interactions

Project leader: Alexander Raphael Groos, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany

Discipline: Earth Sciences & Environment: Global change & Climate observation

Station(s): Station Hintereis (Austria)

The HEFEX II project brings together experts on glacier surface energy balance and boundary layer processes from different career stages to instrument an accessible mountain glacier (Hintereisferner) in the Tyrolean Alps in summer 2023. As part of a developing international working group on ice-atmosphere interactions between several institutes, HEFEX II aims to enhance the characterisation of the boundary layer structure over alpine glaciers and to explore the role of heat advection and surface properties in determining the turbulent exchange of energy at the glacier-atmosphere interface. A better understanding of glacier-atmosphere interactions in high mountain environments is essential for a reliable projection of the response of mountain glaciers to climate change and their future evolution and contribution to catchment runoff. Through the collaboration of multiple group members visiting the INTERACT Station Hintereis for a joint one-month measurement campaign, it will be possible to study the interplay between heat advection, turbulent heat exchange, katabatic winds and ice melt on Hintereisferner under varying synoptic and environmental conditions using a unique network of measuring instruments. Devices permanently installed at or in the vicinity of the station (e.g. terrestrial LiDAR) will be complemented by state-of-the-art measuring instruments on the glacier (e.g. Eddy-covariance and IRGASON turbulence towers) and novel measuring techniques (e.g. heat exchange observations with thermal cameras and drone-based atmospheric sounding), successfully applied at other alpine sites before. The combination of detailed meteorological and glaciological observations provides an ideal test case for exploring glacier boundary layer processes not available at many mountain sites in the world.