

2 Master theses: cold air pool for technical snow production - joint work in an interdisciplinary project setting -

WANTED: 2 motivated master students: 1 in meteorology and 1 in physical geography, for a joint project to investigate the *efficient use of a cold air pool for technical snow production and snow management* in the cross-country skiing area of Seefeld (Tyrol)

Supervisors: Prof. Ivana Stiperski and Dr. Manuela Lehner (Meteorology), Prof. Ulrich Strasser and Dr. Michael Warscher (Geography)

In Seefeld (Tyrol), a cold-air pool, forming in a natural terrain depression at the valley floor, is successfully used for efficient technical snow production. This technical snow is then used for the tracks of the world cup cross country area (<https://www.seefeld.com/en/cross-country-skiing-tyrol>). Down in the valley floor, snow can be produced earlier, for considerably longer period of time and more efficiently than on the adjacent slopes, due to the given terrain shape and frequent formation of cold air pools.

In the framework of two master theses we want to investigate this unique situation and explore the potential to further improve the technical snow production and the snow management strategy. For this purpose, a monitoring program and first steps towards simulating of the air and energy fluxes, as well as of the snow production, will be undertaken. The existing data base is very good; a ZAMG climate station is located inside the depression, and a high-resolution laser scanning DEM of the area (for summer) has been acquired already. We want to extend the existing monitoring program and you as a master students will participate in setting up additional measurement infrastructure required for quantification of the relevant fluxes of air mass, energy, and water.

Work tasks for the master theses include:

- Meteorology: monitoring of temperature profile(s) and distribution of the surface energy balance, and of the wind field; computation/simulation of the air mass flow into and out of the depression and of the respective energy exchange. Inflow of cold air mass is visualized by means of smoke bomb experiments.

- Geography: terrain analysis with the high resolution (summer) laser scanning data, monitoring of the winter snow depth evolution, analysis of the seasonal depression shape evolution, simulation of technical snow production and respective cold air usage according to ambient conditions.

The two master theses are embedded in a joint project with the Tourismusverband Seefeld, the Schneezentrum Tirol and Prof. Reinhold Steinacker being partners.

Required skills: enthusiasm for interdisciplinary work in a project team, experience in numerical modelling and data analysis.

Start as early as possible.

Please contact Prof. Ivana Stiperski (ivana.stiperski@uibk.ac.at) and/or Prof. Ulrich Strasser (ulrich.strasser@uibk.ac.at).