# Submitted Abstract

ID IMC22-FSAbstr- 679

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|---|---|
| **First Author**<br>First Name<br>Last Name | <br>Mathias (1)<br>Bavay |
| **Submitting Author**<br>First Name<br>Last Name | <br>Mathias<br>Bavay |
| **Correspondence** | bavay@slf.ch |
| **Co-Authors**<br>>> E-Mails will be not listed | Anderegg, Dionis (2); Bebi, Peter (1,3); Fierz, Charles (1); Fiddes, Joel (1); Frei, Esther R. (1,3); Gröbner, Julian (4); Van Herwijnen, Alec (1); Herzog, Franz (1); Hubert, Markus (8); Jonas, Tobias (1); Lehning, Michael (1,5); Liechti, David (1); Lötscher, Hanspeter (6); Marty, Christoph (1); Phillips, Marcia (1,3); Weber, Rudolf (7) |
| **Organisations**<br>>> for readability limited to 7<br>>> full list can be found online | 1: WSL Institute for Snow and Avalanche Research SLF<br>2: ZHAW Zürcher Hochschule für Angewandte Wissenschaften<br>3: Climate Change, Extreme Events and Natural Hazards in Alpine Regions Research Centre CERC<br>4: Physikalisch-Meteorologisches Observatorium Davos / World Radiation Center<br>5: WSL/SLF – EPFL Laboratory of Cryospheric Sciences<br>6: Amt für Natur und Umwelt Graubünden (ANU)<br>7: Bundesamt für Umwelt BAFU |
| **Country** | Switzerland |
| **Region** | Western Europe |
| **Title** | The Davos Environmental Dataset. |
| **Keywords** | Standardization, Timeseries, Stations, Meteorology, Solar Radiation, Boundary Layer |
| **Type** | List Of Focus Session |
| **Focus Session ID** | 48 |

## Abstract

The Davos Environmental DataSet aims to contain as many timeseries as possible, measured by automatic stations within a radius of a few tens of kilometers around Davos, Switzerland and spanning an altitudinal range of 2500 m. It currently consists of data from around 50 stations with data extending over a period of 25 years with sampling rates ranging from 20 Hz up to hourly as well as daily for one soil temperature timeseries. At least 19 stations have over 20 years of continuous data with many stations offering a ten minute temporal resolution. The measured parameters cover a wide range of topics, from atmospheric boundary layer, solar radiation, mountain meteorology to cryospheric sciences. The raw data provided by several institutions have been standardized into a common format with a common set of parameter names, units and a common metadata standard. Three levels of processing are provided: the standardized raw data, the raw data after removing known periods of invalid data and the data after applying a combination of statistical and physically-based filters. The full processing from the raw data in their original format to the highest processing level is contained in a configuration file, one per station. The MeteoIO pre-processing meteorological library (Bavay and Egger, 2014) generates the dataset in a fully reproducible way (Bavay et al., 2022) after reading this configuration file.
The dataset is designed to answer questions like: Which spatial interpolation method should be used depending on the number of stations and their spatial and altitudinal distribution? What is the impact of mixing high quality sensors with low quality ones? What is the ideal density of stations depending on topography and weather patterns? Is it possible to detect "spatial outliers" such as cold air pools? What are the performances of various gap filling strategies (temporal interpolations, spatial interpolations, parametrizations)? Which correction methods work best for various typical measurement errors and sensor limitations (unventilated sensors, spikes, tilt correction)? This dataset can be used to force models of various mountain processes in research areas such as catchment hydrology, snow cover distribution, snow cover stability, permafrost and soil temperatures modeling as well as to validate those numerical models.
Bavay, M., & Egger, T. (2014). MeteoIO 2.4. 2: a preprocessing library for meteorological data. Geoscientific Model Development, 7(6), 3135-3151.
Bavay, M., Reisecker, M., Egger, T., & Korhammer, D. (2022). Inishell 2.0: semantically driven automatic GUI generation for scientific models. Geoscientific Model Development, 15(2), 365-378.