

A new concept for high resolution temperature analysis over complex terrain

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High resolution temperature analysis over complex topography is often difficult due to the specific influence of orography and thus requires a special methodology. A new concept of temperature named Low Level Temperature (LLT) is defined. The LLT can be obtained if the potential temperature from station observations is reduced to the height of the so-called Minimum Topography which is a special low level topography that accentuates basins and valleys but smoothes out single summits and scarped slopes.

The Vienna Enhanced Resolution Analysis (VERA) is used to produce a comprehensive set of LLT analyses over the Alpine region by evaluating three-hourly synoptic data of ECMWF for the period 1980-2001. LLT fields are then evaluated climatologically in order to gain both two-dimensional representations and single grid point time series. Mean LLT fields for different months and times of the day provide spatially and temporally highly resolved information on temperature fields over basins and valleys i.e. the main settlement areas in mountainous terrain. The proposed presentation will describe both theory and climatological applications of the LLT approach.