

Alpine Test Site Guetsch: Meteorological measurements and wind turbine performance analysis

COST 727 Measuring and forecasting atmospheric icing on structures

Météo Suisse, Payerne / *METEOTEST* Bern / <http://www.meteotest.ch/cost727/index.html>

Project outline of the wind energy part

This part of the project is based on previous studies of the IEA Wind Annex XIX "Wind Energy in Cold Climates". These results shall be verified and made accessible to a wider audience.

The project will be combined with the project "Alpine Test Site Gütsch: Meteorological measurements and wind turbine performance analysis" which runs within the COST 727 Action. Parts of this projects are included in the COST project, others are supplementary (e.g. Ice throw survey)

The main goals of the project are:

- Verification of the recommendations of the IEA Wind Annex XIX in alpine regions
- Improvement of the turbine operation under icing conditions: from de-icing to anti-icing
- Formulation and publication of a handbook 'Operation of wind turbines under icing conditions in the alpine region'

The following parameters of the wind turbine shall be recorded:

- Wind speed and direction on hub height (52 m)
- Turbulence Intensity (all directions)
- short term fluctuation of wind direction
- vertical speed
- power output of turbine
- rotor data (rpm, unbalance, load at root of blade)

additional measurements:

- ambient temperature and humidity
- icing on blade or nacelle by ice detector
- webcam for monitoring of icing on blades
- monitoring of inbuilt deicing system (hot air)
- observation of ice throw by wind turbine

In addition, the measured data of MeteoSwiss station will be included in the analysis.

Furthermore, ice throw will be mapped manually.