

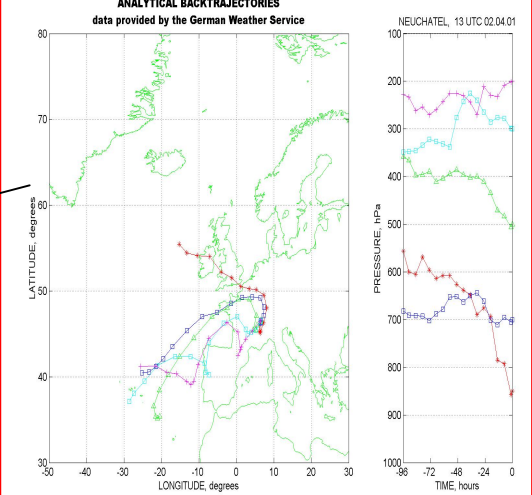
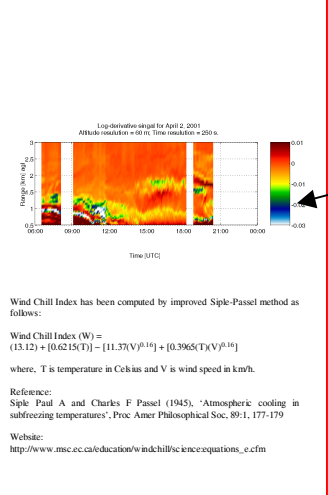
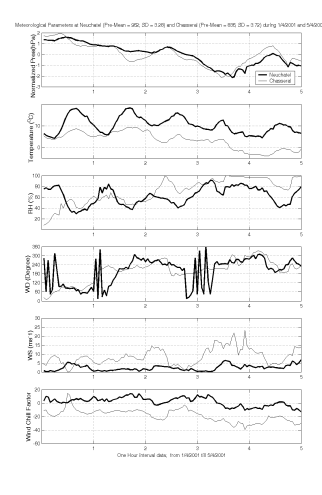


## Backscatter lidar observation of PBL above Neuchâtel (Switzerland) during Winter Bise wind

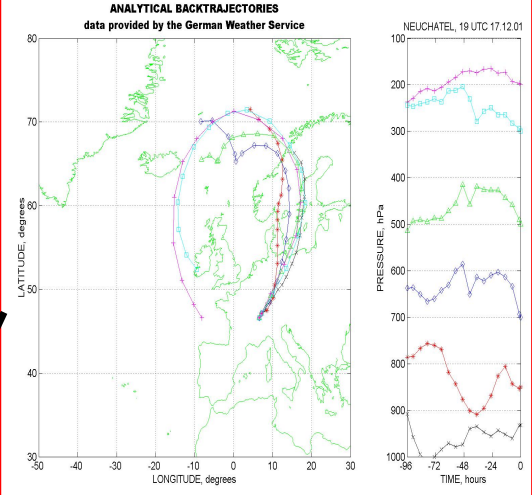
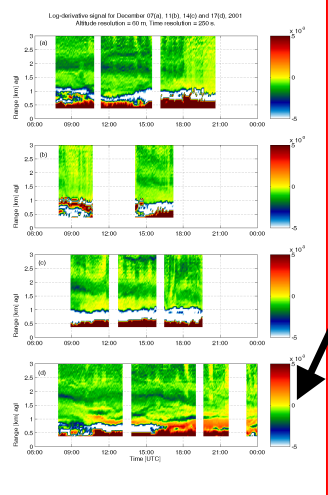
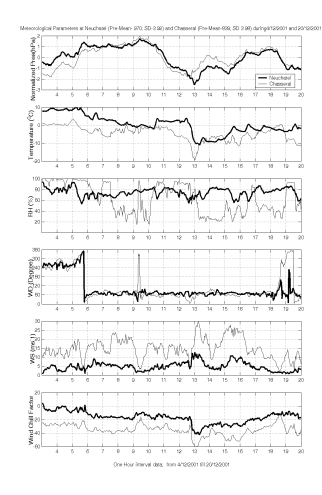
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"Bise" is a local, violent and stormy wind in Switzerland. Its development is due to a northeast-southwest pressure gradient along the Swiss Midland at 850 hPa level. It brings colder temperature to the affected regions. This work presents aerosol observation in the atmospheric boundary layer and lower troposphere under the effect of the Bise wind at Neuchâtel (Switzerland) with the use of a ground based backscatter lidar system. This study period is during December 5-18, 2001. Pollution transport to the affected regions is shown by the existence of different layers at various heights. A set of backtrajectories informs about the origin of these aerosol layers. The low-temperature and high speed of the wind is found affecting the development of the atmospheric boundary layer during the event with low-altitude top of Aerosol Mixed Layer, although during these phases, the sky is characteristically clear. Information is included about the wind-chill factor, one-of-the-most-predominant features of Bise wind.

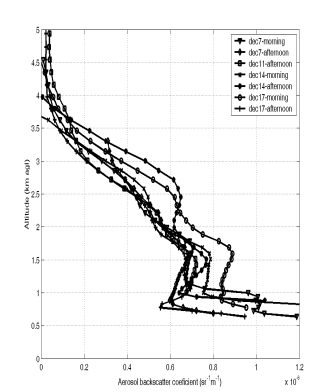
### Meteorological and lidar observation and wind back-trajectories analysis during *NON-BISE*



### Meteorological and lidar observation and wind back-trajectories analysis during *WINTER-BISE*



### Aerosol Backscatter Coefficient profiles during *WINTER-BISE*



### CONCLUSIONS:

- Bise affects the PBL development in two ways:
  - it suppress the thermal development of PBL with very low ground temperature.
  - high unidirectional wind drags away all the generated heat and evaporation from the ground surface.
- Aerosol layers with height and time consistency, at about 2.0kms and 3.0kms (asl), indicates Bise to be an 'pollution transporter'.
- Analytical backtrajectories indicate that these aerosol rich airmass is transported with the Bise from industrial part of Europe, north of Swiss midlands.
- The height constancy of aerosol layers for longer period informs that the downfall of pollution particles was not made possible due to the high wind speed (or low-level-jet) and its inherited kinetic energy