



EUREF Symposium London June 6-9, 2007

The influence of snow coverage on GPS antennas of the mountain EPN stations

**František Mantlík, Vladimír Schenk,
Zdeňka Schenková and Milada Grácová**

Institute of Rock Structure and Mechanics AS CR, v.v.i.

V Holešovičkách 41

192 09 Praha 8

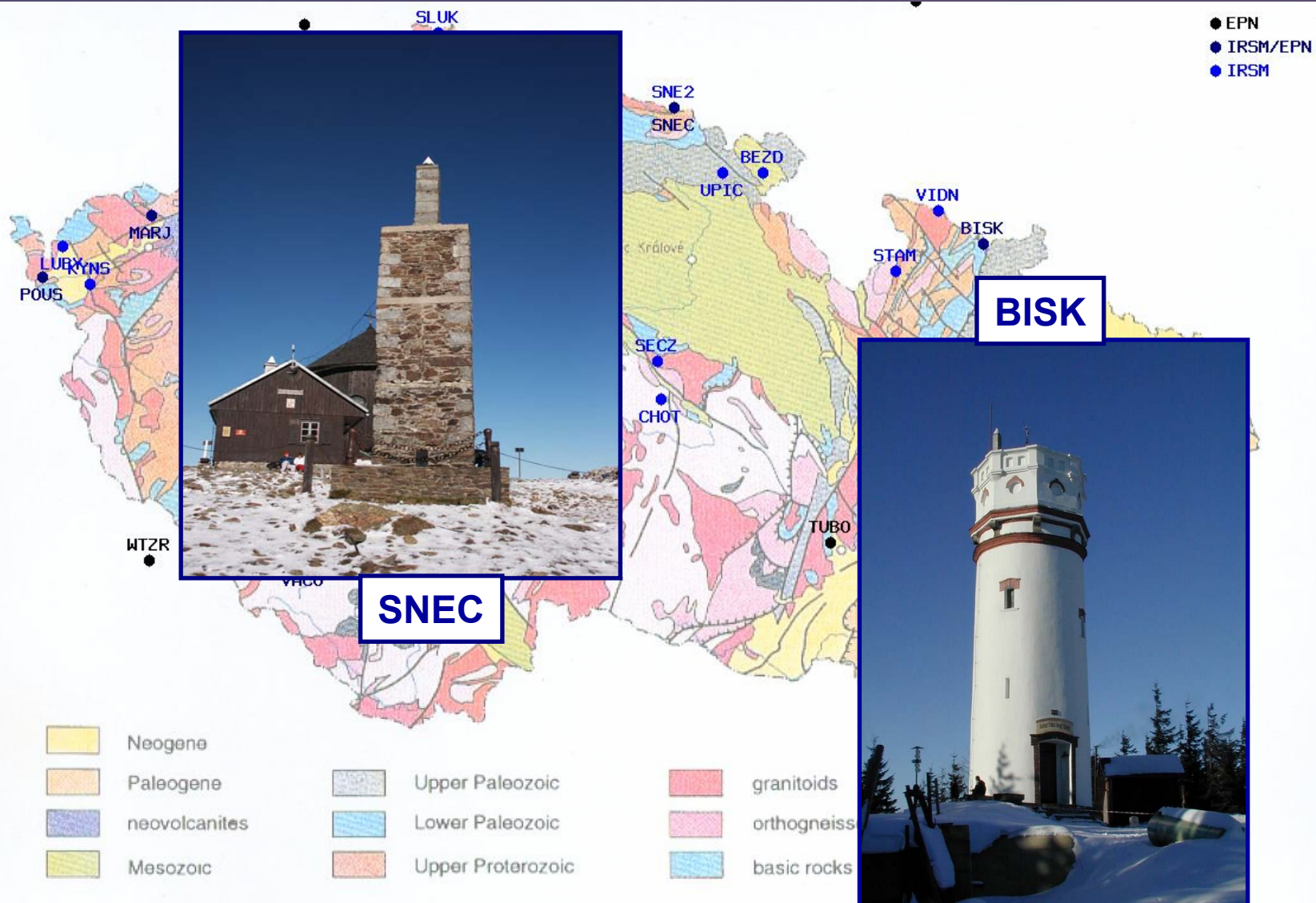
mantlik@irsm.cas.cz



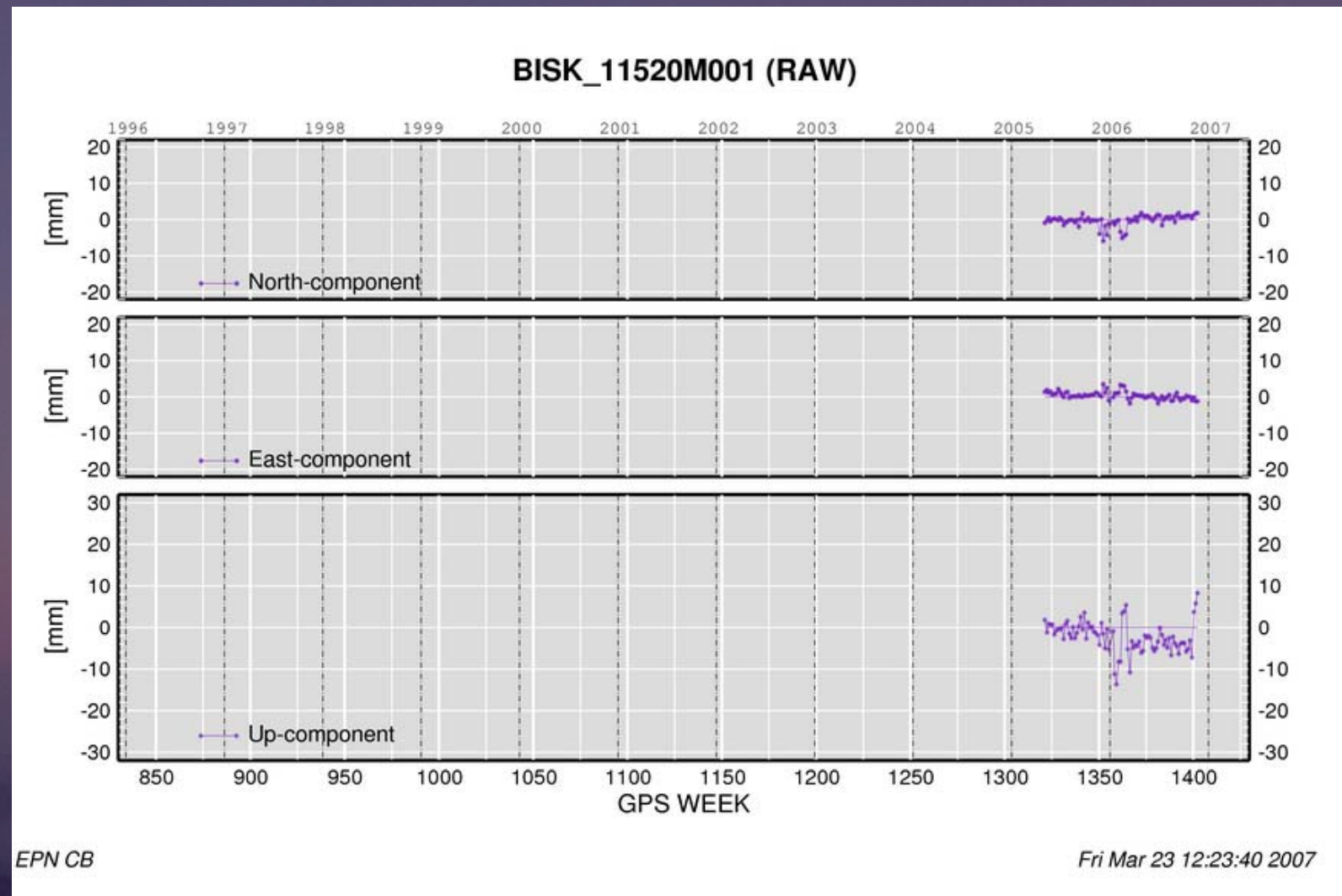
IRSM



GEONAS mountain observatories

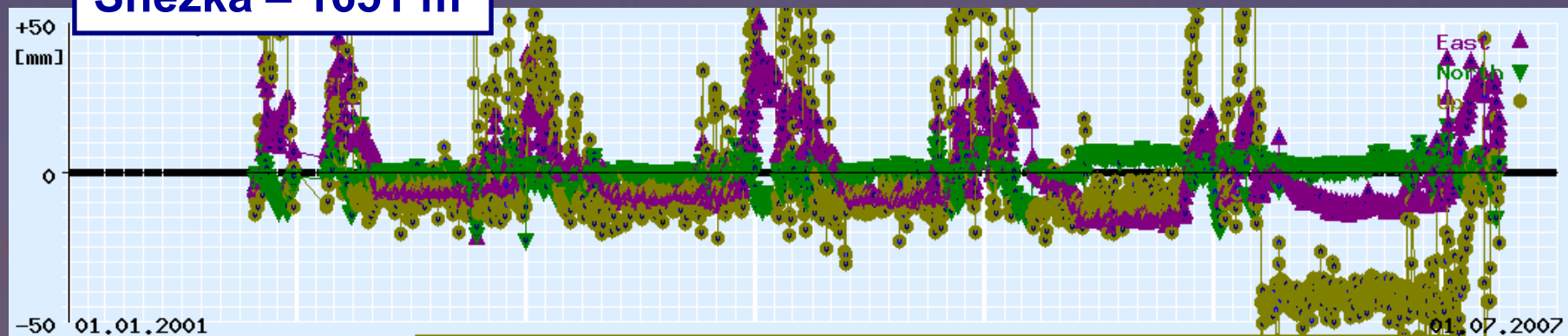


Disturbances at the EUREF time series

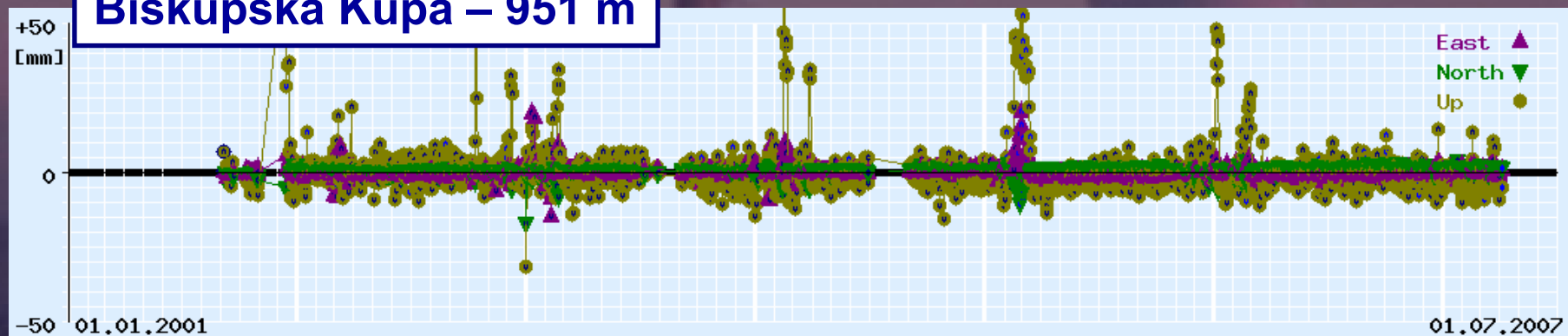


Disturbances at the time series - GEONAS

Sněžka – 1651 m



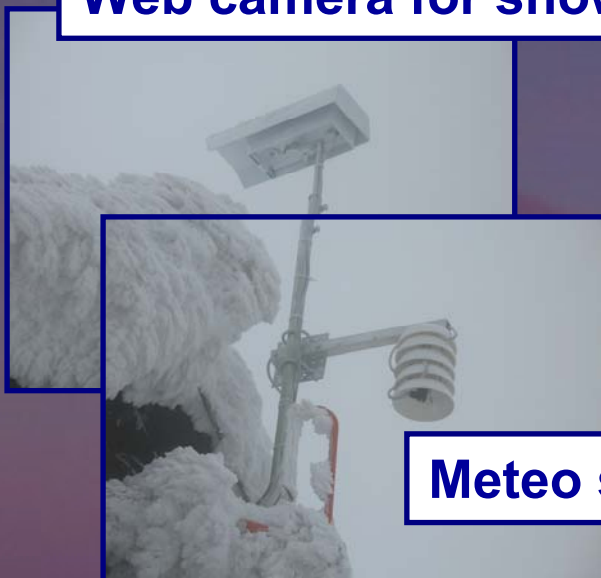
Biskupská Kupa – 951 m



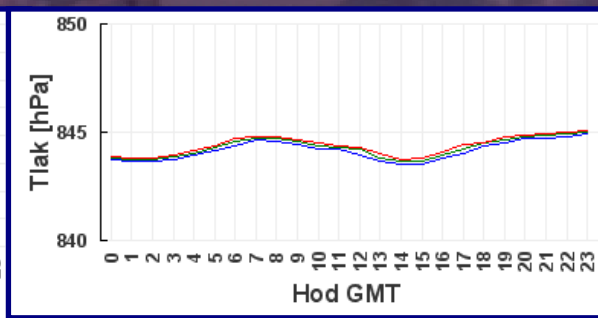
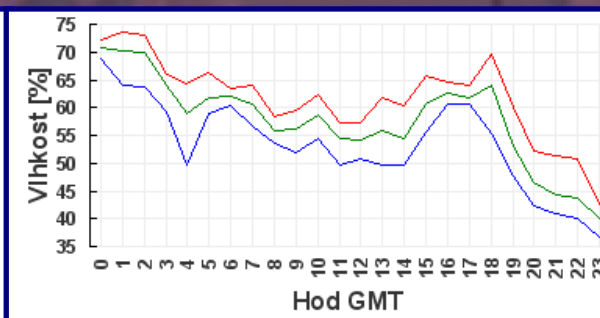
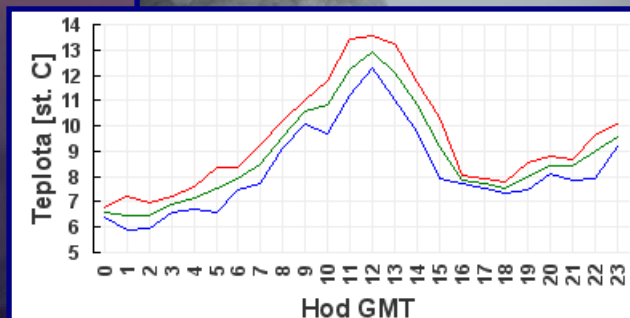
Registration of the meteorological conditions

SNEC since 16.3.2006:

Web camera for snow coverage monitoring



Meteo sensors – humidity, air pressure, temperature



Web cameras at GEONAS observatories

BISK



MARJ



PRAG



SNEC



STAM



Monitoring recently at 5 GEONAS observatories (5 min interval):
BISK, MARJ, PRAG, SNEC, STAM

Snow coverage classification

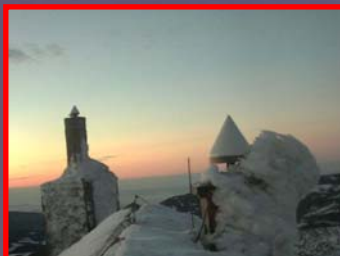
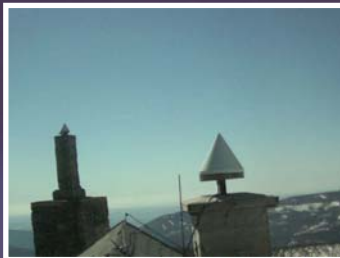
0 – none

1 – very low, homogenous coverage

2 – significant frost or snow coverage, possibly inhomogenous

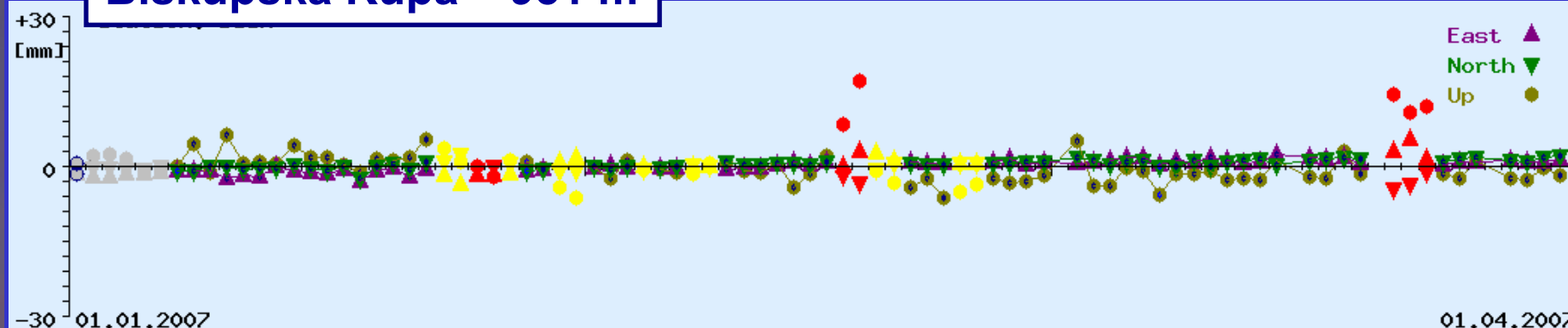
3 – high coverage

4 – extreme and inhomogenous coverage

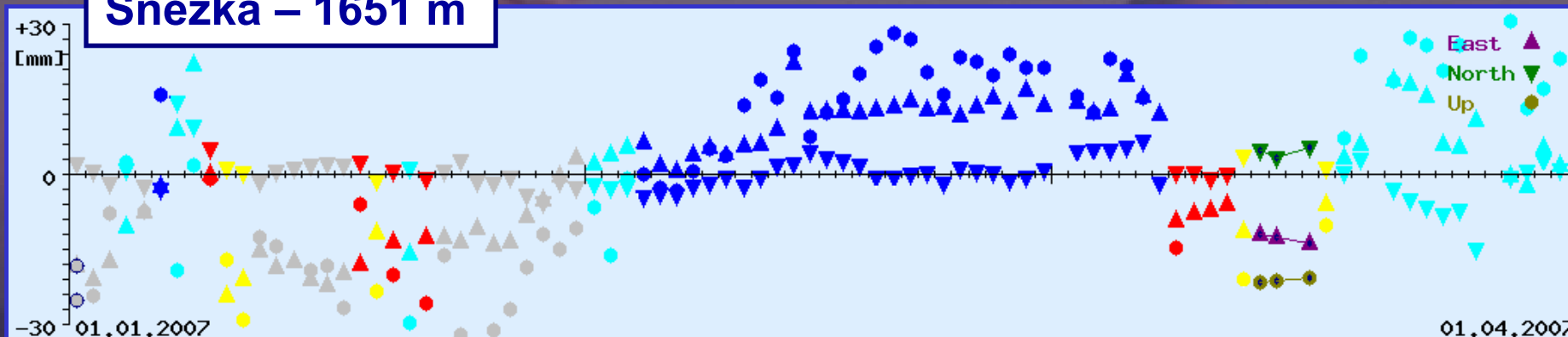


Snow coverage effects on time series

Biskupská Kupa – 951 m

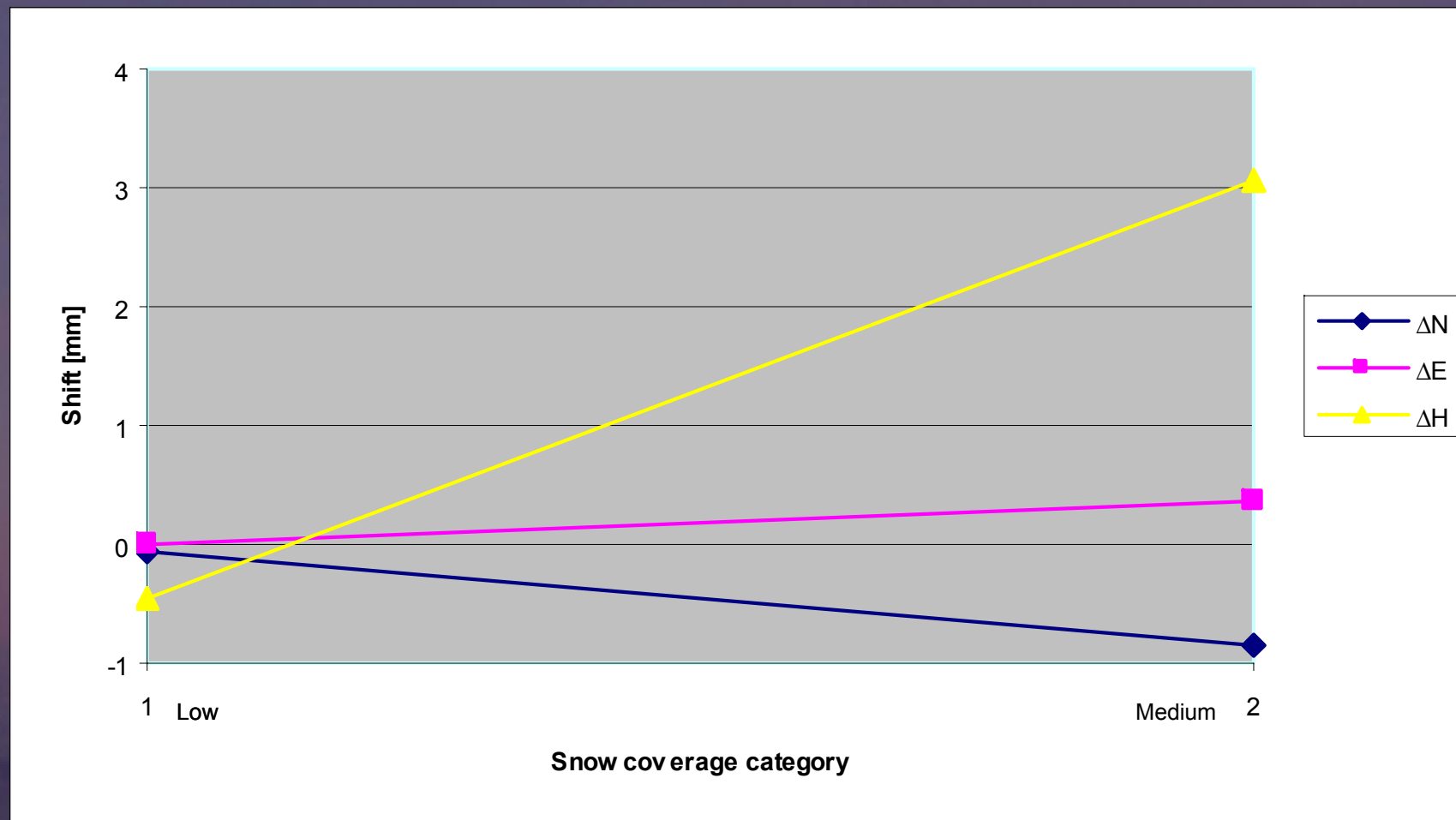


Sněžka – 1651 m

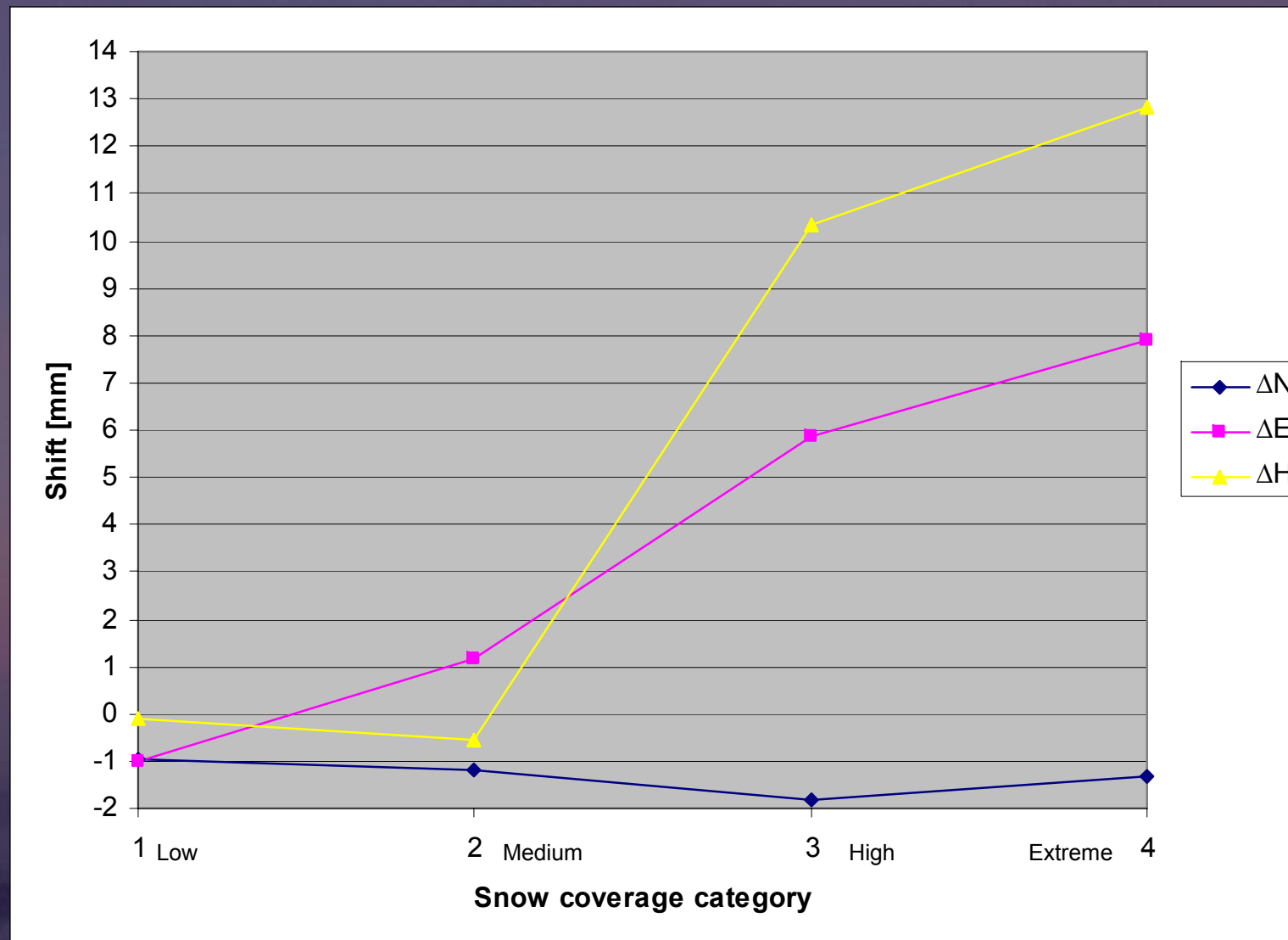


Snow coverage colors: ● -n/a ● 1-low ● 2-medium ● 3-high ● 4-extreme

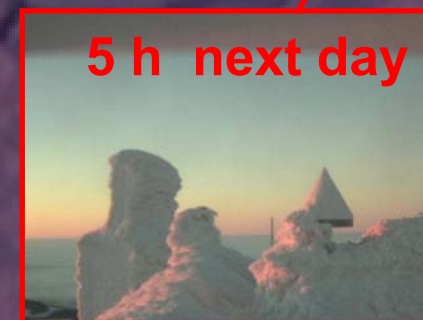
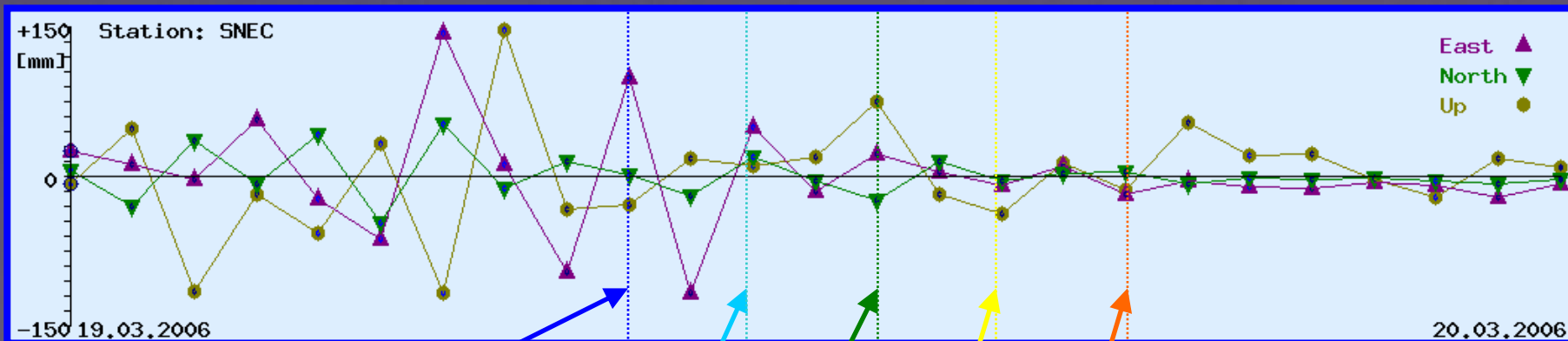
Snow influence at the station Biskupská Kupa



Snow influence at the station Sněžka



Snow melting effect March 19-th, 2006



Conclusions

- mountain observatories of the GEONAS network suffer from the snow cover at the antenna domes
- systematic position shift is strongly dependent on the snow cover thickness and shape mainly at the SNEC observatory
- withdrawing the solutions affected by the snow effects makes the time series usable in winter season even for geodynamic studies

Outlook

- quantification of the snow coverage from the photographs
- empirical dependencies between snow coverage shape and thickness and the determined antenna position shift
- application of empirically obtained corrections to the time series



IRSM

The End.



Thank you for your attention.