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The effects of frosty snow coverage on the GPS antennas and the possibilities of their being eliminated from the antenna positions time series

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The time series of permanent GNSS observatories located high up mountain positions are often affected by frosty snow coverage and other attendant meteorological phenomena. The effects mentioned above were observed during the winter season 2005/2006 on the time series of two of our observatories sited on the tops of the Sněžka Mt. (SNEC observatory, 1600 m, the Giant Mts.) and the Biskupská Kupa Mt. (BISK observatory, 950 m, the Jeseníky Mts.). To correlate the frosty snow effects with inconsistencies and outliers which occurred in the time series, both of these observatories were equipped with web cameras apart from the standard meteorological temperature, relative humidity and air pressure sensors in March 2006. The cameras make possible the photographing of changes in snow coverage on the domes of the GPS antennas. The variations in time series were then compared with individual photos. The GPS and snow coverage data were analyzed to obtain time series for the winter season without the solutions that are affected by the snow coverage. The corrected winter time series for the SNEC and BISK observatories are herewith presented. Comparisons with the time series of nearby observatories sited at relatively low sea levels are discussed.

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