



The Mountain Observatory Bjelašnica -History, Analysis, Homogenization and Interpretation of a more than 100 years long Temperature Data Set

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For further analysis of climate change variability resp. temperature anomalies we have to consider several interactions in the atmosphere more precisely. Especially the vertical interactions play a decisive part in our climate system (geo-biosphere) and should be studied in detail. In particular - if a longer time scale is the target - outlier tested, homogenized and completed data sets in high elevated regions can serve as basis for such research and modelling initiatives.

HISTALP currently provides 18 time series of mountainous sites (implementing summit stations over 1400m sea level) in the Greater Alpine Region. Not yet included long time series, like Bjelašnica, appeared to be useful for the climate variability analysis. The well documented station history and metadata of the observatory on Bjelašnica summit is one of the basics for homogenization and interpretation of data sets. Along with painstaking quality control of single values homogenization tests detected four breaks in the 1894-2008 Bjelašnica summit series. The monthly adjustments ranged from -0.9 to $+0.9^{\circ}\text{C}$. The average length of a homogeneous subinterval of 23 years as well as the magnitudes of the adjustments are in accordance to the respective findings of other homogenizing attempts.

The mean centennial temperature trend of $+0.11^{\circ}\text{C}/\text{decade}$, as well as the decadal variations are highly similar at Bjelašnica to those at the other summit observatories of the greater alpine region. The same applies to the regional low elevation mean and to nearby valley or basin sites like Sarajevo. Only at a scale of single months, seasons and years significant differences exist compared to valley sites, to remote summit sites and to the large scale regional mean.

Well studied sites such as Bjelašnica are rare. Thus one of the future tasks of HISTALP will be to collect; homogenize and evaluate additional long term and high quality time series for regions of special interest: high elevated regions and regions with a low station density. Also an expansion of the HISTALP area to regions outside the GAR is feasible.