



GNSS for climate research: a twenty year perspective of using ground-based networks in northern Europe

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The variability of atmospheric water vapour an important factor both in weather forecasting and climate research. Ground-based GNSS observations can provide estimates of the equivalent propagation delay of radio signals in the zenith direction with an uncertainty of typically less than 1 cm, corresponding to approximately 1 kg/m^2 in the amount of integrated water vapour (IWV). Since water vapour is costly to measure with a sufficient temporal and spatial resolution, for the mentioned applications, the GNSS technique offers an alternative to traditional sensors. An ongoing EUMETNET project evaluates the close to real-time application of weather forecasting, but in this presentation we will focus on the assessment of ground-based GNSS data for climate research.

A GNSS reference network has been operating in Fennoscandia for more than twenty years. Examples of IWV results obtained from these GNSS data will be presented. We will especially study the following three different time scales: trends over decades, annual components, and diurnal components. These results can be used for climate monitoring and for evaluation of climate models.