



## **Potential of Ground-based GPS Slant Delays for Numerical Weather Prediction**

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The novel processing softwares support estimation of Zenith Total Delay (ZTD) as one parameter in the geodetic network solution. Meteorological institutes have paid attention on assimilation of ZTD estimates into Numerical Weather Prediction (NWP) models. ZTD is an indicator of atmospheric humidity in a vertical column above the ground-based receiver of the Global Positioning System (GPS). Processing of ZTD makes use of the assumption on the atmospheric isotropy.

In the presence of strong humidity gradients, e.g. frontal structures, ZTD alone is insufficient in representing the atmospheric humidity structures. The Slant Total Delays (STD), estimated for the actual signal paths between the satellites and the receivers, are considered by meteorologists to complement this information. The anisotropic nature of the humidity information provided by the STD observing system will be of special interest in forecasting of severe weather phenomena.

A concept of Anisotropic Mean Zenith Delay (AMZD) is introduced as a measure of anisotropy contained in STD data. As the methodology for STD observation modelling is available, AMZD can be calculated based on either observed or modelled STD. The potential of the STD observations will be investigated by examining the characteristics of AMZD derived from both observed and modelled STD values. The grid resolution of the NWP model is expected to play a key role; therefore, various grid configurations of the High Resolution Limited Area Model (HIRLAM) will be used for STD modelling.