



Using ground based slant delays in GPS solutions

M. Tervo (1), R. Eresmaa (2), M.Poutanen (1), H. Järvinen (2)

(1) Finnish Geodetic Institute, Geodeetinrinne 2, PL 15, 02431 Masala, Finland, (2) Finnish Meteorological Institute, Erik Palménin aukio 1, PL 503, 00101 Helsinki, Finland

Troposphere is one of the most significant sources of error in precise GPS solutions nowadays. Especially the height component is sensitive to the tropospheric delay. We have studied the effect of the troposphere delay using slant delays derived from a numerical weather model (HIRLAM). We calculated 12 vectors for 61 days, lengths of the vectors varying between 110 and 1100 km. Using the slant delay instead of a standard troposphere model the variation of the up component is reduced remarkably. For example at station Degerby in Åland, the standard deviation diminishes from 3.4 cm to 1.0 cm for this 61 days period, meaning that the variance diminishes over 90 %. We also found that in the slant delay solutions the length of the vector does not affect the variance remarkably.