



Advances in high-resolution GPS-Tomography: First results in regional mountainous networks of Switzerland

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GPS-tomography allows to determine the spatial distribution and temporal variation of the atmospheric water vapour content using GPS measurements. A GPS-tomography software package has been developed, which is based on a least-squares inversion of double-differenced GPS observations. In this paper, we present preliminary results of a study, carried out in the mountainous Canton of Valais (Switzerland). The project is aimed at the high-resolution GPS-tomography in view of local precipitation forecast and hydrological hazard assessment. In this context, two campaigns with a high-density GPS network were carried out in July and October 2005. Meteorological ground data as well as data of a solar spectrometer were acquired, and 51 radiosondes were launched for validation purpose. The disposition of the radiosonde data is specially suited to evaluate the potential of the method of high-resolution GPS-tomography. Furthermore, profiles calculated from the numerical weather model aLMo of MeteoSwiss are available for comparison with the tomographic results. An overall agreement of better than 5 ppm (refractivity units) can be achieved. The recent state of development will be presented and the data achieved will be discussed in terms of accuracy and reliability.