**Observing Atmospheric Effects of the Next Major Volcanic Eruption With the GNSS Radio Occultation Technique**

U. Foelsche (Institute for Geophysics, Astrophysics, and Meteorology, University of Graz, Universitaetsplatz 5, A-8010 Graz, Austria; ph. +43-316-380-8590, fax +43-316-380-9825; e-mail: ulrich.foelsche@uni-graz.at); G. Kirchengast (Institute for Geophysics, Astrophysics, and Meteorology, University of Graz, Universitaetsplatz 5, A-8010 Graz, Austria; ph. +43-316-380-5260, fax +43-316-380-9825; e-mail: gottfried.kirchengast@uni-graz.at);

The GNSS (Global Navigation Satellite System) radio occultation (RO) technique is based on a satellite-to-satellite limb sounding concept using GNSS microwave signals to probe the Earth's atmosphere. The propagation of the signals is influenced by the atmospheric refractivity field resulting in slowing and bending of the signal. The atmospheric phase delay as the principle observable is measured with millimetric accuracy. It is the basis for high-quality retrievals of atmospheric key variables, particularly of temperature profiles. Highest temperature accuracies of < 1 K are obtained in the upper troposphere and lower stratosphere, i.e., where the influence of large volcanic eruptions is most pronounced. The global coverage, all-weather capability, high accuracy, and self-calibrated nature of RO data suggests them as a promising tool for global short- and long-term monitoring of atmospheric temperature change. Several RO missions are planned for the near future. The recently started CHAMP satellite mission provides the very first opportunity to create real RO based climatologies over the period 2002 to 2005. We currently perform a 25-year climate observing system simulation experiment using realistically simulated RO data and start to prepare global temperature climatologies based on CHAMP RO data. We report results suggesting that atmospheric temperature changes caused by the next major volcanic eruption can be observed with unprecedented accuracy using the RO technique.