



## **Six-hourly time series of horizontal troposphere gradients in VLBI analysis**

Daniel Landskron, Armin Hofmeister, David Mayer, and Johannes Böhm

Vienna University of Technology, Wien, Austria (daniel.landskron@geo.tuwien.ac.at)

Consideration of horizontal gradients is indispensable for high-precision VLBI and GNSS analysis. As a rule of thumb, all observations below 15 degrees elevation need to be corrected for the influence of azimuthal asymmetry on the delay times, which is mainly a product of the non-spherical shape of the atmosphere and ever-changing weather conditions. Based on the well-known gradient estimation model by Chen and Herring (1997), we developed an augmented gradient model with additional parameters which are determined from ray-traced delays for the complete history of VLBI observations. As input to the ray-tracer, we used operational and re-analysis data from the European Centre for Medium-Range Weather Forecasts. Finally, we applied those a priori gradient parameters to VLBI analysis along with other empirical gradient models and assessed their impact on baseline length repeatabilities as well as on celestial and terrestrial reference frames.