



Impact of different tropospheric mapping functions on VLBI determined TRF, CRF and position time series

Volker Tesmer (1), Johannes Boehm (2), Robert Heinkelmann (2), Harald Schuh (2)

(1) Deutsches Geodätisches Forschungsinstitut, DGFI (tesmer@dgfi.badw.de), (2) Institute of Geodesy and Geophysics, IGG, Vienna University of Technology

The impact of the troposphere on microwave measurements such as VLBI and GPS is difficult to predict and to estimate sufficiently detailed. It has been shown many times that different mapping functions significantly influence almost the whole set of parameters estimated in geodetic solutions, mostly even systematically. This is also the case for the tilting of the troposphere and azimuthal dependence described by gradients. As systematic differences between various solutions should be avoided, this presentation compares estimated TRF, CRF and position time series w.r.t. systematic differences, scale, annual signals as well as station position repeatability. All solutions are computed at DGFI using the OCCAM6.1 and DOGS-CS software and VLBI data from 1984 till 2005. They solely differ in the mapping functions for the troposphere: NMF (Niell) and the recently developed GMF (Global) consist of easy to handle stand-alone formulae whereas the IMF (Isobaric) and the VMF1 (Vienna Mapping Function 1) are determined from numerical weather models.