



Baseline length repeatability and vertical point position accuracy of VLBI CONT05 sessions for different mapping functions and cutoff angles

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Because baseline lengths are independent of rotations of the polyhedron formed by several VLBI stations, baseline length repeatabilities can be taken as accuracy criteria of the VLBI network. In this study baseline length repeatabilities of 15 sessions of the VLBI CONT05 campaign were investigated for certain mapping functions (VMF1, GMF, NMF) and cutoff elevation angles (5, 7, 10, 15, 30 degrees). From the analysis with the VLBI software Occam 6.2, the following conclusions can be drawn: All three mapping functions yield about similar baseline length repeatabilities for the cutoff angles 5, 7 and 10 degrees, but significantly larger repeatabilities for 15 and 30 degrees. A cutoff angle of 7 degrees gives the best results for all mapping functions. Baseline length repeatabilities with VMF1 are slightly better than those with NMF and GMF. Additionally, the baseline length repeatabilities are converted to station height repeatabilities by adopting the geometrical relation and applying a least-squares approach where the baseline length and the vertical position errors are taken as measured values and unknowns of the adjustment, respectively. The comparison between these vertical position errors and the formal errors for the station heights provided by Occam for each 24 h session shows a good agreement, apart from a certain scale factor.