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Impact of GPS satellite antenna offsets on scale changes in global network solutions

M. Ge, G. Gendt, G. Dick, F. P. Zhang, and Ch. Reigber

GeoForschungsZentrum Potsdam, Department of Geodesy andRemoteGeoForschungsZentrum Potsdam, Department of Geodesy andRemote Sensing, D14473 Potsdam, Germany Sensing, D14473 Potsdam, Germany (maor@gfz-potsdam.de)

We demonstrate that biases in the GPS satellite antenna phase center offsets could lead to scale biases in global network solutions, which change along with the observed satellite constellation. To validate the IGS standard offset values, satellite-specific offsets are estimated from GPS data and the network solutions are re-adjusted with these estimates. Both the estimated offsets and the re-adjusted network scales confirmed that the IGS standard offsets are significantly biased and produce scale changes of more than 1 ppb. From investigations of the offset inhomogenities among satellites belonging to the same block type, it is strongly recommended that block-type-specific offsets used presently as IGS standard should be replaced by satellite-specific ones.