

Single-band absolute astrometry

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Abstract. The ionospheric contribution affects path delay at radiofrequencies. When simultaneous dual-band VLBI observations are used for absolute astrometry, the residual contribution of the ionosphere is at a level of several picoseconds. But there are two cases when we need to process VLBI single band group delays: a) some observations provided usable data only for one band; b) an entire experiment used only one band. I have developed a novel approach to utilize GNSS TEC maps to get the best solutions for these two cases and provided realistic estimates of residual errors. Analysis of dual-band observations in the mode when one of the bands was not either partially or entirely used identified the presence of declination errors. Approaches to characterize and mitigate these systematic errors are discussed. Applications of this technology is discussed. In particular, the impact of residual ionospheric path delays at K-band on estimates of source positions is quantitatively evaluated and conclusions about advantages and disadvantages of high frequency absolute astrometry are made.