Transformation parameters of session-wise CRFs with referred to the ICRF3

Niu Liu

1. Session-wise CRF

The source positions derived from observations in each sessions solely were drawn from the `.lso` file available at the Paris Observatory Geodetic VLBI Center [1], which contains estimate of source positions from session-wise independent VLBI solution, and we used these position to form the session-wise celestial reference frame. Then I estimated the rotation and glide parameters of these session-wise CRFs with respect to the ICRF3 based on the subset of sources common to the ICRF3 defining source ensemble (I also considered using all common sources to the ICRF3 but the results are not presented here). Source whose position difference between the session-wise CRF and ICRF3 S/X is greater than 10 mas or is three times greater than their formal uncertainty was removed. Only sessions with more than six sources common to the ICRF3 defining source ensemble were considered, which rejected most sessions before the 1990 Figure 2 presents the estimates of rotation and glide parameters. I also computed the root-mean-square of every 100 data points weighted by their formal uncertainties as the scatter of the parameters, as indicated by the red dashed line therein. The rotation parameters are generally stable at the level of 100-200 μas since 1995, except a small jump in ϵ_x and ϵ_y at about 2017. A similar jump can also be seen in g_z. So one may say that the ICRF3 stability is satisfied among 1990 (or 1979)-2021.
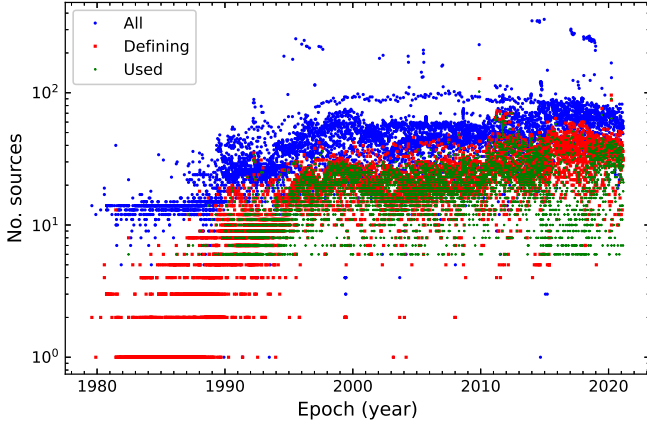

Fig. 1. Number of sources in session-wise radio source catalogs. The numbers of all sources, sources among the ICRF3 defining source list, and sources actually used to estimate the rotation and glide are shown in different markers.
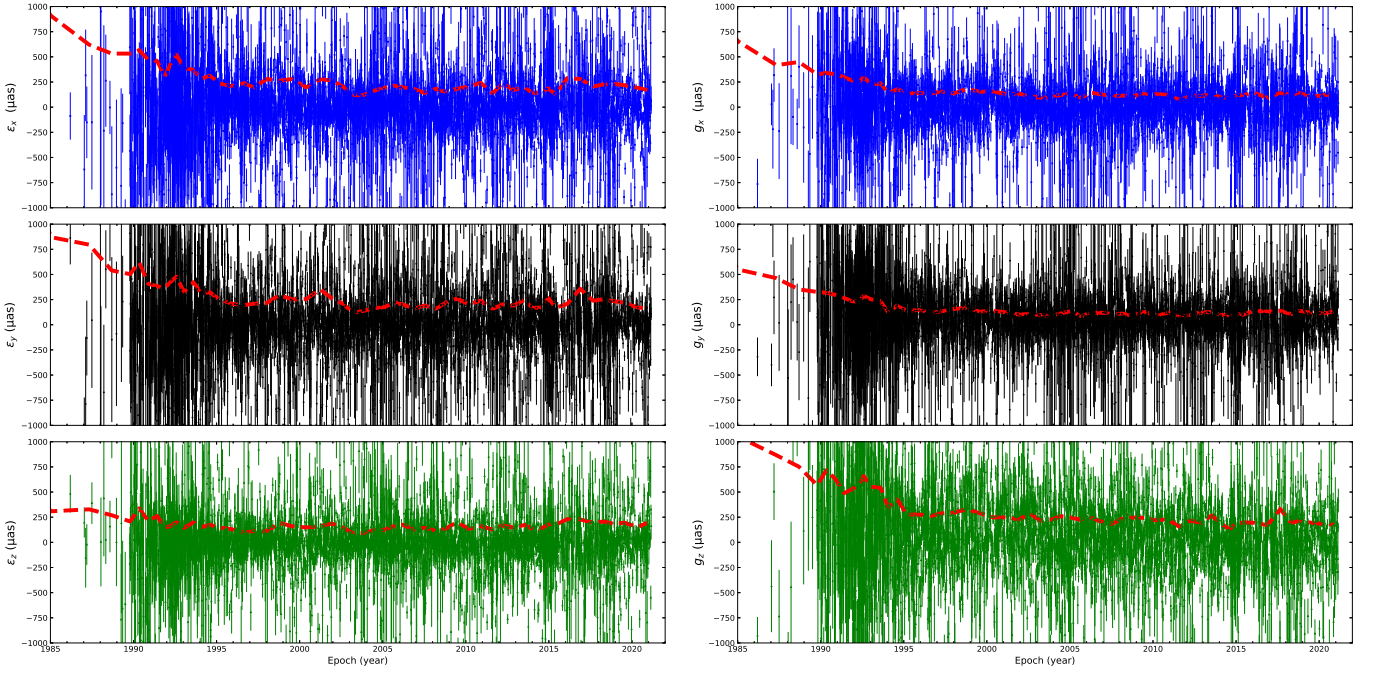
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[1] http://ivsopar.obspm.fr/radiosources/opa2021r.lso

Fig. 2. Rotation (*left*) and glide (*right*) of session-wise CRFs with referred to the ICRF3 *S/X*-band catalog. The formal uncertainty of parameter estimate is indicated by the errorbar. The red dashed line shows the weighted root-mean-square (wrms) of every 100 points.