

Establishing celestial reference frames at different ranges of wavelengths

C. Ma, NASA Goddard Space Flight Center; A. Andrei, Observatório Nacional/MCT, G. Bourda, Observatoire de Bordeaux; C. Jacobs, Jet Propulsion Laboratory

The current fundamental celestial reference frame is the second realization of the International Celestial Reference Frame (ICRF2) derived from dual frequency VLBI observations at 13/3.6 cm. The ICRF2 catalog includes ~3000 compact radio sources, largely quasars, of which 295 defining sources establish the coordinate axes with an accuracy of ~10 microarcseconds. More limited catalogs have been developed at 1.2 cm using the VLBA (~300 sources) and at 3.6/0.9 cm using the Deep Space Network (~500 sources), primarily to support spacecraft navigation. Anticipating the prospective Gaia optical catalogue, a set of ~400 radio weak but optically bright ($V \leq 18$) objects is being studied at 13/3.6 cm for the radio-optical frame tie using the high sensitivity of the EVN + VLBA. The Gaia QSO catalog currently has ~100,000 defining objects whose morphology and variability are being tabulated. The characteristics, limitations and future development of the various wavelength catalogs will be discussed along with the anticipated radio-optical frame transfer.