

EXTENDING THE ICRF TO HIGHER RADIO FREQUENCIES: 24 & 43 GHZ

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Astrometric observations of active galactic nuclei have been used to construct quasi-inertial global reference frames, most notably the International Celestial Reference Frame (ICRF) which now forms the basis for all astrometry including deep space navigation. The ICRF was defined using X- (8.4 GHz) and S-band (2.3 GHz) observations collected over 20+ years. There are several motivations for extending this work to higher frequencies, namely, to construct a more stable frame based on more compact sources, to provide calibrators for phase referencing, and to support spacecraft navigation at higher frequencies.

Survey observations using the Very Long Baseline Array at K-band (24 GHz) and Q-band (43 GHz) have been undertaken to pursue these goals. Three observing sessions have covered the full 24 hours of right ascension and declination down to -30 deg. The resulting catalog of 80+ sources has K-band median formal position uncertainties of < 200 micro-arcseconds. The Q-band positional uncertainties are about 1.5 times larger. Group delay residuals were excellent at ~20 psec weighted RMS. Comparison of the K-band frame to the S/X-band ICRF shows systematic errors which we will discuss.

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