Quasars making up the quasi-inertial celestial reference frame are not perfect point sources, instead exhibiting jet components beamed along the line of sight. Synchrotron self-absorption causes core positions of quasars to shift with observing frequency, getting closer to the base of the jet at high frequencies. Core offsets in excess of 1 mas (corresponding to 1 cm on a 2000 km baseline) between S and X bands have been reported in individual sources. We investigate the effects of this phenomenon on global VLBI solutions. Source structure is another important factor, with source positions becoming increasingly inaccurate for extended or multi-component sources. Temporal variability of jet brightness introduces a further uncertainty in the observed source position. Inter-Stellar Scintillation surveys provide catalogues of compact sources which can be used in the ICRF, improving geodetic measurements.