PROSPECTS FOR DETERMINING GALACTIC ROTATION FROM VLBI MEASUREMENTS

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Analyses of radio interferometric data acquired during the past two decades are now yielding angular coordinates of several hundred extragalactic sources with formal uncertainties approaching a small fraction of one milliarcsecond. The question arises whether these VLBI data are capable of sensing the rotation of our Galaxy against a background of "fixed" extragalactic objects. The purely geometric effect is estimated to alter the angular coordinates of objects 1 billion light years distant to the extent of only 1 picoradian/year, which is well below present VLBI capability. The special relativistic effect for an observer on a moving platform, however, is an order of magnitude larger. Within the Solar System, it amounts to an apparent rotation of the extragalactic sources of 14 picoradians/year. Over the 17-year extent of VLBI measurements, this accumulates to ≈ 40 μas, which is within a factor of 5 of the typical formal uncertainty of the coordinates of an individual object. Modeling of the VLBI (May observables was recently extended to include the capability of estimating the Galactic rotation rate. This presentation will give results of such analyses of existing data, and discuss the prospects for detecting Galactic rotation.