A PHASE-COHERENT LINK USING THE ANIK-B SATELLITE FOR GEODETIC VLBI

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ABSTRACT

A joint U.S.-Canada experiment is in progress to demonstrate the capabilities of phase-coherent VLBI for the measurement of Universal Time and Polar Motion. This paper was to present the results of the satellite link evaluation experiments. The 12/14 GHz transponder of the ANIK-B synchronous communications satellite has been used to provide a phase-coherent link between radio observatories in Maryland, Ontario and British Columbia. The system operates in a shared-user mode with television transmissions and makes only modest power and bandwidth demands on the satellite channel. A two-tone scheme is used with two-way transmissions on each path. The performance of the link can be separated from that of the frequency standards by use of the phase closure relationship for the three stations. The measured phase stability of the link is 2×10^{-15} for a period of one day. This result is comparable to that of the best separated hydrogen masers. When combined with the VLBI results the error in the UT measurement is $\pm$ 200 microseconds.

(ABSTRACT ONLY)

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