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RESEARCH ON THE CEI SYSTEM IN GEO SATELLITE OBSERVATION

Abstract

CEI(Connected Element Interferometer) is a real-time system of phasic interferometer on short baseline. The observed values of CEI system is time delay of target signals, for example, satellite or quasar, and we could calculate the target's angular position. Relative to the Very Long Baseline Interferometer(VLBI)system, the two stations are quite near, about teens to score of kilometers, what could counteract the majority of the time delay errors of the signal passes through troposphere and ionosphere. CEI system makes more improvement on the observation accuracy. The CEI system utilizes interferometer theory to get a time delayτ , which is a time difference between a same wavefront of target arrival at two stations. The system has a same frequency standard, which is spread in a high speed data link between the two tracking stations, what could realize the accurate measurement of delayτ .CEI system is more flexible to choose and locate the baseline; we can achieve an angular position measurement precision of 50nrad, the precision is considerable with long baseline's, moreover, CEI doesn't need along continuous tracking arc. The CEI system observes the GEO satellite, which could validate the correlation arithmetic to resolve the time delay. This article analyses the theory of CEI system, the error sources of CEI and introduces the establishment of a successful CEI verification system, and gives the analysis result of an experimentation of observation a GEO satellite with a CEI system.