

The Use of Daily Geodetic UT1 and LOD Data in the Optimal Estimation of UT1 and LOD With the JPL Kalman Earth Orientation Filter (KEOF)

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Over the past few years, a number of new daily Earth rotation data sets have become routinely available. The Jet Propulsion Laboratory (JPL) Kalman Earth Orientation Filter (KEOF) utilizes several of these data sets in its generation of optimally interpolated UT1 and LOD series and in its short-term prediction of these quantities in support of spacecraft navigation. Which of these data sets to employ in KEOF is an ongoing, operational decision. In addition, KEOF requires an accurate stochastic model of UT1 and LOD variability, particularly at the several-day periods which these new data sets are able to measure.

Three series of more-or-less daily Very Long Baseline Interferometry (VLBI) estimates of UT1 arc, or were until recently, available. These are different analyses of the same one-hour, East-West intercontinental baseline VLBI measurements. Global Positioning System (GPS) estimates of the rate of change of UT1 (or its integral) are available daily from at least six analysis centers. Although all GPS estimates are derived using the same global set of raw GPS data, the centers typically use different subsets of GPS stations in their analyses, as well as different software and model assumptions. Daily Satellite Laser Ranging (SLR) estimates of UT1 and LOD are also available from two sources. Each of the above series purports to measure the same or related quantities (UT1 or LOD) with different sets of errors, both systematic and random.

In this paper, we discuss several issues relevant to the use of these data within KEOF, present the results of our data intercomparisons, and illustrate the effects of using various data sets within KEOF. **issues we** may examine include the noise structure of each data set, a data set's consistency with our assumed stochastic models, and a data set's level of contribution to our combined solution.

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