

Preparations for a Second Earth Orientation Parameters Prediction Comparison Campaign

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Introduction

Earth orientation parameters (EOP) comprising of nutation offsets, pole coordinates, and dUT1 represent a critically needed link between the terrestrial and the celestial reference frame. Predictions of EOP are important for several operational activities including navigation of deep-space satellite missions, the pointing of astronomical instruments, or satellite-based positioning on Earth. Various agencies and institutions worldwide process space geodetic observations to obtain estimates for the EOP with short latencies as a basis for the subsequent prediction.

1st EOP Prediction Comparison Campaign

The 1st EOP Prediction Comparison Campaign (2006 – 2008) provided a very comprehensive assessment of the capabilities of different EOP prediction methods. Since that time, much progress has been made in terms of improved geodetic data processing, reduced VLBI latency, and routine availability of model-based forecasts of effective angular momentum functions for atmosphere, oceans, and the terrestrial hydrosphere.

2nd EOP Prediction Comparison Campaign

Re-assessment of the various EOP prediction capabilities will be pursued in the frame of the 2nd Earth Orientation Parameters Prediction Comparison Campaign (2nd EOP PCC). The main idea of the campaign is to compare the various methods, models and strategies that can be used to predict EOP.

The 2nd EOP PCC is led by the office maintained by the Space Research Centre, Polish Academy of Sciences (CBK PAN) in Warsaw in cooperation with GeoForschungsZentrum (GFZ) in Potsdam. The campaign is being performed under the auspices of the IERS. The dedicated IERS Working Group on 2nd EOP PCC has been established in March 2021.

The 2nd EOP PCC is expected to officially start in summer 2021 and run until 2023. Predictions of each EOP are welcome, as well as cross-institute teams are accepted to participate in the campaign. New types of prediction methods might enter at any time during the course of the campaign.

The EOP PCC Office invites to visit the 2nd EOP PCC and the IERS Working Group websites for more information and encourage to participate in the 2nd EOP Prediction Comparison Campaign.

2nd EOP PCC technical preparations

Completed tasks are development of the website and making SFTP incoming server available, as well as description of general rules with manuals for registration and data submission. The pre-operational phase of the 2nd EOP PCC, which started on June 7, 2021, is currently underway. It allows participants and supervisors to test the system and solve all the issues before the official campaign begin.

The results will be compared and judged by the EOP PCC Office against the IERS EOP C04 series. As soon as alternative final EOP solutions become available (e.g., from ESA, JPL, or any of the ITRF combination centres), individual submissions will be also evaluated by the office against those alternative series. Each predicted time series will be evaluated by the same statistical methods concerning mean prediction error, correlation, mean value, standard deviation, and other, to indicate the most appropriate and trusted prediction methods.



2nd Earth Orientation Parameters Prediction Comparison Campaign

EOP PCC

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Home page

Welcome on the page of 2nd Earth Orientation Parameters Prediction Comparison Campaign (2nd EOP PCC)

Earth orientation parameters (EOP) comprising of nutation offsets, pole coordinates, and dUT1 represent a critically needed link between the terrestrial and the celestial reference frame. Predictions of EOP are important for a number of operational activities including navigation of deep-space satellite missions, the pointing of astronomical instruments, or satellite-based positioning on Earth. Various agencies and institutions worldwide therefore maintain capacities to rapidly process space geodetic observations to obtain estimates for the Earth orientation parameters with short latencies as a basis for the subsequent prediction. Whereas many users require predictions for only a few days into the future, IERS routinely publishes predictions for up to 1 year ahead within its Bulletin A.

Fig. 1. An excerpt from the campaign's website: <http://eoppcc.cbk.waw.pl/>