Commission 4: A new webpage for ephemerides comparison

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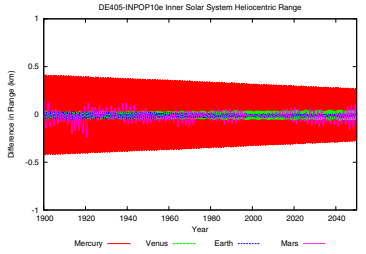
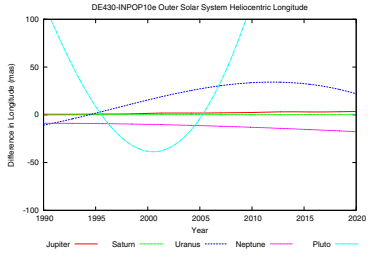
Commission 4 Ephemerides is an IAU Division A Fundamental Astronomy commission. As part of its objectives work has been carried out to produce a new webpage that provides a tool for comparing three ephemerides, in particular EPM2011/m, DE430/LE430 and INPOP10e. These ephemerides are from expert groups around the world; Russia's Institute for Applied Astronomy, USA's Jet Propulsion Laboratory and France's IMCCE and Paris Observatory.

What are the aims of Commission 4?

- Maintain cooperation and collaboration between the national offices providing ephemerides, prediction of phenomena, astronomical reference data, and navigational almanacs.
- Encourage agreement on the bases (reference systems, time scales, models, and constants) of astronomical ephemerides and reference data. Promote improvements to the usability and accuracy of astronomical ephemerides, and provide information comparing computational methods, models, and results to ensure the accuracy of data provided.
- Maintain databases containing observations of all types on which the ephemerides are based.
- Encourage the development of software and web sites that provide astronomical ephemerides, prediction of phenomena and astronomical reference data to the scientific community and public.
- Promote the development of explanatory material that fosters better understanding of the use and bases of ephemerides and related data.

Example Plots





Information

Information has been requested from each of the ephemerides providers and a summary is shown on the webpage in an easy to compare format. The table includes, among other items, a comparison of which solar system objects are included, the type of coordinates and the reference system used, the dates covered and also details on the file structure of the ephemerides and how they may be read. There are various links to more detailed information and documentation located on the providers' websites, as well as download links.

Still to come

More information is still to be added to the website to aid ephemerides comparisons including details on initial assumptions used, how asteroids and TNOs are included and other parameters used.

Why do we need a comparison?

Ephemerides are used in a variety of ways by different users. As there is a choice of which ephemerides to use a comparison must be made to inform the user of the strengths, weaknesses, similarities and differences of the available options. This webpage hopes to provide such a comparison.

The webpage makes no claim as to which ephemerides should be used in any particular circumstance. Instead it just provides some tools to help the user make an informed decision on their choice of ephemerides.

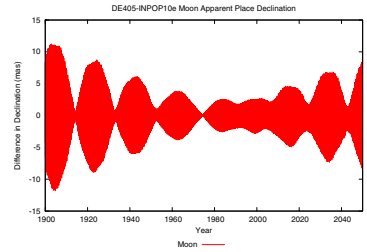
Visual Comparisons

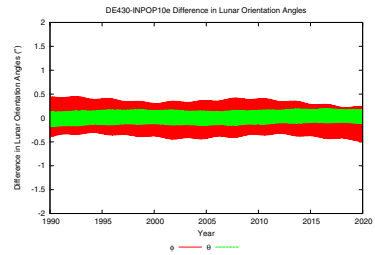
Plots have been produced comparing the three ephemerides. The values compared are

- The heliocentric longitude and latitude of the planets.
- The barycentric and heliocentric distances of the planets.
- The geocentric range, longitude, latitude, right ascension and declination of the Moon.
- The lunar orientation and rotation angles.

The plots are produced over both long and short time periods.

Example Plots





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Questions and comments welcome.

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Acknowledgements

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