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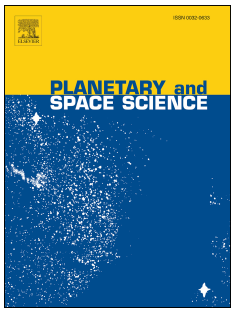

The rotational elements of mars and its satellites

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The Rotational Elements of Mars and Its Satellites[☆]

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Abstract

The International Astronomical Union (IAU) defines planet and satellite coordinate systems relative to their axis of rotation and the angle about that axis. The rotational elements of the bodies are the right ascension and declination of the rotation axis in the International Celestial Reference Frame and the rotation angle, W, measured easterly along the body's equator. The IAU specifies the location of the body's prime meridian by providing a value for W at epoch J2000. We provide new trigonometric series representations of the rotational elements of Mars and its satellites, Phobos and Deimos. The series for Mars are from a least squares fit to the rotation model used to orient the Martian gravity field. The series for the satellites are from a least squares fit to rotation models developed in accordance with IAU conventions from recent ephemerides.

Keywords: Mars, Phobos, Deimos, rotational elements

1. Introduction

Approximately every 3 years the IAU Working Group on Cartographic Coordinates and Rotational Elements (WGCCRE) (Archinal et al., 2011, 2012) issues a report recommending coordinate systems that can be used for making maps of solar system bodies. The WGCCRE defines a coordinate system in terms of the body's mean axis of rotation and an angle about that axis. The direction of the mean axis, the body's pole, is specified by the value of its right ascension and declination in the International Celestial Reference