

JPL Mars Gravity Fields: Recent Model Changes and Results

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Over the past year there have been improvements in the models that affect the determination of the gravity field of Mars. The most notable change in the Mars gravity modeling is the change in the Mars orientation model. We have switched from the IAU coordinate system (either 1991 or 2000, e.g. Seidelmann et al., *Celes. Mech. & Dyn. Astron.* 82, 2002) to the coordinate system used by Mars Pathfinder (Folkner et al., *Science* 278, 1997). The new orientation model of Mars includes rigid-body nutation, seasonal spin variations, and polar motion. The Mars Pathfinder and Viking lander data have been merged with the MGS tracking data to help constrain the Mars orientation. Other model improvements include the Mars ephemeris and spacecraft component pointing. Together, these model changes have produced promising seasonal trends in the gravity field of Mars as well as detection of the tidal Love number and a new precession solution. In addition, four days of Mars Odyssey tracking data just after completion of aerobraking are included in the more recent gravity solution. This data contains some high frequency gravity information from a 200x500 km orbit with periapse near the equator.