

Plate Motion Models From Space Geodesy: The Case of ITRF2008

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Until the time where long time-span of space geodesy' observations become available, tectonic plate motion models were only constructed from geological data information. Several studies were conducted to estimate global plate motion models derived from geodetic observations. We present a global model composed of rotation poles for 15 tectonic plates, using an ITRF2008 velocity field comprising 203 sites of high quality and with long observation history. Quality assessment has been undertaken, indicating the well performance of ITRF2008 determination of station positions and velocities, compared to past solutions, including ITRF2005. We evaluate the impact on rotation pole estimations of (1) correcting horizontal site velocities by post glacial rebound effects and (2) the frame origin time evolution. We examine the quality of the derived ITRF2008 Plate Motion Model and the No Net Rotation (NNR) condition uncertainty, using different possible estimation options and by comparisons to geological models: NNR-NUVEL-1A and the newly available NNR-MORVEL56. We show the usefulness of the availability of such a model for the implementation of a precise reference frame associated with a Global Navigation Satellite System, such as Galileo.