



## **The gravity field of Jupiter after the first three orbits of Juno**

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In 2016 the spacecraft Juno completed its first three perijove passes, respectively on Aug. 27 (PJ-1), Oct. 19 (PJ-2), and Dec. 11 (PJ-3), at an altitude of about 4000 km above the cloud level. Measurements of the spacecraft range rate were carried out across closest approach in all three passes, thanks to a coherent, two-way tracking at X band (7.2-8.4 GHz) from the antennas of the Deep Space Network. In PJ-1 a second downlink frequency at Ka band (32.5 GHz) allowed a good calibration of the path delay variations due to the Io plasma torus. During PJ-3, dedicated to radio science and Jupiter gravity determination, the full onboard Ka band system was activated, enabling a coherent radio link at 32.5-34 GHz and high accuracy range rate measurements. After removal of media effects (earth troposphere and Io plasma torus), tracking data from all three passes were combined to obtain a first cut determination of Jupiter gravity field. We report on this preliminary solution, and compare it with the theoretical expectations available in the literature.