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Latest developments in lunar gravity field recovery within the project GRAZIL

Sandro Krauss (1), Harald Wirnsberger (1), Beate Klinger (2), Torsten Mayer-Gürr (2), and Oliver Baur ()

(1) Austrian Academy of Science, Department of Satellite Geodesy, Graz, Austria, (2) Graz University of Technology, Institute of Geodesy, Working Group Theoretical Geodesy and Satellite Geodesy, Graz, Austria

The project GRAZIL addresses the highly accurate recovery of the lunar gravity field using intersatellite Ka-band ranging (KBR) measurements collected by the Lunar Gravity Ranging System (LGRS) of the Gravity Recovery And Interior Laboratory (GRAIL) mission. Dynamic precise orbit determination is an indispensable task in order to recover the lunar gravity field based on LGRS measurements. The concept of variational equations is adopted to determine the orbit of the two GRAIL satellites based on radio science data. In this contribution we focus on the S-band two-way Doppler data collected by the Deep Space Network. As far as lunar gravity field recovery is concerned, we apply an integral equation approach using short orbital arcs in the order of one hour. In this contribution special attention is given to the refinement of our processing strategy in conjunction with an increase of the spectral resolution. Based on these considerations we present the latest version of a lunar gravity field model developed in Graz which is based on KBR observations during the primary mission phase (March 1 to May 29, 2012). Our results are validated against GRAIL models computed at NASA-GSFC and NASA-JPL.