

A GRACE Occultation Status Summary

T. Yunck, T. Meehan, C. Dunn, B. Tapley, Ab Davis, C. Reigber

Jet Propulsion Laboratory, California Institute of Technology

Abstract

The twin spacecraft of the joint US-German GRACE (Gravity Recovery and Climate Experiment) mission were launched into a near-polar orbit from Plesetsk, Russia, in March of this year. The primary mission is to employ precise satellite-satellite tracking to map the earth's gravity field with unprecedented accuracy, and to repeat this every month for the next five years. Since March, GRACE has been undergoing thorough system checkout and commissioning and is expected to be declared operational in the near future. Each GRACE spacecraft carries a specially modified BlackJack GPS receiver to perform centimeter-level precise orbit determination, to acquire the satellite-satellite crosslink range rate measurements with an accuracy of about 1 micron/sec, and to provide precise attitude knowledge through an integrated star camera. Each spacecraft is also equipped with a GPS occultation antenna, one facing in the forward velocity direction to catch rising occultations and one pointed in the reverse velocity direction for setting occultations. Together, these could add up to 600 GPS soundings per day to the NASA data set, bringing the daily total from CHAMP, SAC-C, and GRACE to between 1200 and 1500. At this writing the two GRACE spacecraft and the GPS instruments are in good health and functioning normally. This presentation will provide an overview of the GRACE mission, its current status, and provisional plans to activate the occultation sensors.