



The Status and Future Directions for the GRACE Mission

Byron Tapley (1), Srinivas Bettadpur (1), Frank Flechtner (2), and Michael Watkins (3)

(1) University of Texas, Center for Space Research, Austin, United States (tapley@csr.utexas.edu), (2) German Research Centre for Geosciences - GFZ, (3) NASA Jet Propulsion Laboratory

The twin satellites of the Gravity Recovery and Climate Experiment (GRACE) were launched on March 17, 2002 and have operated for over 13 years. The mission objectives are to sense the spatial and temporal variations of the Earth's mass through its effects on the gravity field at the GRACE satellite altitude. The primary mission objectives of GRACE are to measure: 1) the Earth's time-averaged gravity field over the mission life and 2) the monthly variations in the mean gravity field at wave lengths between 300 and 4000 km. The major cause of the time varying mass is water motion and the GRACE mission has provided a continuous decade long measurement sequences which characterizes the seasonal cycle of mass transport between the oceans, land, cryosphere and atmosphere; its inter-annual variability; and the climate driven secular, or long period, mass transport signals. Measurements of continental aquifer mass change, polar ice mass change and ocean bottom currents are examples of paradigm shifting remote sensing observations enabled by the GRACE satellite measurements. In 2012, a complete reanalysis of the mission data, referred to as the RL05 data release, was initiated. The monthly solutions from this effort were released in mid-2013 with the mean fields following in 2014. Corrections to the original release along with alternate solution sets have been reported in 2014. This presentation will review some of the improvements achieved in the reanalysis and the impact of results from this reanalysis on the science investigations. The current mission status and the operations strategy, which are focused on extending the mission lifetime, will be discussed along with the impact of the operations on the future science data products. Finally, the challenges involved in achieving mission overlap with the GRACE Follow On Mission will be summarized.