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EVOLUTION OF GRACE MISSION

Abstract

The Grace mission, carried by National Aeronautics and Space Administration (NASA) and the Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences, has as its main objective acquired a very accurate model of the Earth's gravity field variations, making use of ranging measurements between two satellites. besides, measure and establish a proper profile of the humidity and temperatures of the atmosphere, due to GPS radio occultation technique. In the actual state of the mission, which is, the second generation of satellites, GRACE-FO, it has been carrying an experiment to probe the performance of a laser ranging interferometer technology to support the next generation of satellites for this mission, Mass change. Furthermore, the mission obtained precise maps of the ice mass loss, sea level rise, groundwater deposits, sea surface temperature, ocean bottom pressure and it helps in fire observation and prediction. The future generations will change the actual radio ranging measurements for the laser ranging interferometer, due to its probe to has a better performance. Nevertheless, this optical link present new issues, like the necessity of orienting both spacecrafts in a more accurate way, due to the narrow beam of the laser. This work will present the results obtained by Grace and the evolution between the actual and the future generation of spacecrafts.