



GRACE-FO accelerometers and data processing

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The GRACE FO mission, led by the JPL (Jet Propulsion Laboratory), is an Earth-orbiting gravity mission, continuation of the GRACE mission, which will produce an accurate model of the Earth's gravity field variation providing global climatic data during five years at least. The mission involves two satellites in a loosely controlled tandem formation, with a micro-wave link measuring the inter-satellites distance variation. Earth's mass distribution non-uniformities cause variations of the inter-satellite distance. This variation is measured to recover gravity, after subtracting the non-gravitational contributors, as the residual drag. ONERA (the French Aerospace Lab) is developing, manufacturing and testing electrostatic accelerometers measuring this residual drag applied on the satellites.

The launch of GRACE-FO twin satellites is scheduled on April 14th from Vandenberg US Air force Base, California with a SpaceX launcher. The last tests of the accelerometers have been performed in January on the launch site. In parallel, ONERA team prepares the post-processing of the data, based on the experience acquired through previous geodesic missions but also through the fundamental physics MICROSCOPE mission. Thanks to a physical model of the accelerometer and on-ground or flight calibration of the thermal sensitivity, it would be possible to improve the science return. Methods of detection and suppression of twangs have been developed for MICROSCOPE and can be applied also for GRACE-FO.