

## Photo Release

SPACE SYSTEMS

### **GRACE-FO satellites get an earful**

Acoustic noise test simulates sound impact of rocket launch



*Preparations for the acoustic noise test for the two GRACE-FO satellites, which Airbus constructed for NASA/JPL.  
Photo: Airbus DS GmbH / Mathias Pikelj*

Friedrichshafen/Ottobrunn, 02/05/2017 – The two GRACE-FO (GRACE = Gravity Recovery and Climate Experiment, FO = Follow-On) Earth observation satellites, which Airbus Friedrichshafen developed and constructed for NASA/JPL, were ‘given an earful’ during recent acoustic tests.

The sound impact that builds up during rocket launches was simulated in an echo chamber with a volume of around 1,400 m<sup>3</sup> at IABG in Ottobrunn near Munich. In four test cycles, the satellites in their flight position were subjected to a sound impact of nearly 140 decibels (dB). In comparison, a pneumatic drill produces 100 dB and the human pain threshold is 130 dB. Both satellites passed the tests with flying colours.

NASA’s Jet Propulsion Laboratory JPL (Pasadena, California) in partnership with the German Research Centre for Geosciences (GFZ, Potsdam) will send both GRACE-FO research satellites into a polar orbit at an altitude of around 500 km and at a distance of 220 km apart. This is a follow-on to the GRACE mission, which has been successfully operating since 2002. Both satellites will continually take very exact measurements of their separation distance, which changes depending on the Earth’s gravity. In this way, scientists are able to map the Earth’s gravitational fields.

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A global positioning system and a microwave ranging system enable the distance between the satellites to be measured to within one micron. The GRACE-FO satellites will feature an additional element: a new inter-satellite laser ranging instrument, developed by a German/American joint venture, which will be tested for use in future generations of gravitational research satellites. Orbital perturbations through non-gravitational effects such as aerodynamic braking due to the residual atmosphere are determined with the help of a sensitive accelerometer.

The launch of the GRACE-FO twin satellites is scheduled between December 2017 and February 2018. Over the course of the five-year mission, measurements will be taken to provide an updated model of the Earth's gravitational fields every 30 days. In addition, each of the satellites will supply up to 200 profiles of temperature distribution and water-vapour content in the atmosphere and the ionosphere on a daily basis.

### About Airbus

Airbus is a global leader in aeronautics, space and related services. In 2016, it generated revenues of € 67 billion and employed a workforce of around 134,000. Airbus offers the most comprehensive range of passenger airliners from 100 to more than 600 seats. Airbus is also a European leader providing tanker, combat, transport and mission aircraft, as well as Europe's number one space enterprise and the world's second largest space business. In helicopters, Airbus provides the most efficient civil and military rotorcraft solutions worldwide.

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