

EGU22-12890

<https://doi.org/10.5194/egusphere-egu22-12890>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Status of the Ganymede Laser Altimeter (GALA) for ESA's JUICE Mission

Hauke Hussmann<sup>1</sup>, Kay Lingenauber<sup>1</sup>, Reinald Kallenbach<sup>1</sup>, **Fabian Lüdicke**<sup>1</sup>, Keigo Enya<sup>2</sup>, Nicolas Thomas<sup>3</sup>, Lara Luisa M.<sup>4</sup>, Kazuyuki Touhara<sup>3</sup>, Kobayashi Masanori<sup>6</sup>, and Kimura Jun<sup>5</sup>

<sup>1</sup>DLR Institute of Planetary Research, Berlin, Germany (hauke.hussmann@dlr.de)

<sup>2</sup>ISAS/JAXA, Japan

<sup>3</sup>Physikalisches Institut, University of Bern, Switzerland

<sup>4</sup>CSIC, Instituto de Astrofísica de Andalucía (IAA), Granada, Spain

<sup>5</sup>Osaka University, Japan

<sup>6</sup>Chiba Institute of Technology, Japan

The Ganymede laser-altimeter (GALA) is one of 10 instruments on ESA's Jupiter Icy Moons Explorer (JUICE) mission. The scientific goals cover a wide range from geology, geophysics to geodesy of the icy moons Ganymede, Europa and Callisto. JUICE will explore Jupiter, its magnetosphere and satellites first in orbit around Jupiter before going finally into polar orbit around Ganymede. GALA is developed under responsibility of the DLR Institute of Planetary Research in collaboration with industry and institutes from Germany, Japan, Switzerland and Spain. GALA has two main objectives: (1) providing Ganymede's topography from global to local scales (2) determination of Ganymede's tidal variations of surface elevations. GALA is a single-beam laser altimeter: a laser pulse (1064 nm) is emitted by using a Nd:YAG laser firing at 30 Hz (nominal). After about 3 msec (500 km altitude) the reflection of the pulse from the surface of Ganymede is received by a telescope and transferred to the detector (Avalanche Photo Diode). The signal is digitized and transferred to the range finder module, which determines (a) time of flight (b) pulse shape, and (c) energy of the received pulse. Including information on the spacecraft position and attitude the height of the terrain above a reference surface is determined for each shot from time-of-flight measurements. The GALA flight model was delivered to ESA in August 2021. After several tests on instrument level the integration on the JUICE spacecraft started in September 2021 and first tests were performed successfully in October 2021. With the launch scheduled for 2023, GALA will go through several tests, among them an end-to-end test including laser-receiver measurements. Here we present the instrument's current status with respect hardware integration and regarding the verification of its performance.