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Author: Dr. Masaki Nagai  
OHB System AG, Germany, masaki.nagai@ohb.de

Dr. Tobias Otto  
OHB System AG-Bremen, Germany, tobias.otto@ohb.de  
Ms. Fenna Hartmann  
OHB System AG-Bremen, Germany, fenna.hartmann@ohb.de

FRACTIONATED SUB-SURFACE SOUNDER CONFIGURATIONS FOR GIANT PLANETS  
SATELLITES EXPLORATION

**Abstract**

“Fractionated Sub-surface Sounder Configurations for Giant Planets Satellites Exploration” is an early study activity led by ESA and contracted by the DLR/OHB consortium in Germany, with the aim to investigate the feasibility of future exploration to the icy moons of the giant planets, such as Europa, Ganymede, and Enceladus of the Jovian and Saturnian systems. The intended launch year for such a mission is currently 2050s in the frame of Voyage 2050 program. In the study, a mission to Enceladus of the Saturnian system is considered as a target mission, and the spacecraft concept including enabling technologies for the mission has been investigated. One notable aspect of this mission is that the “fractionated” sounder is the main payload, where a single active radar and multiple passive radars form a multi-static radar system. Those radars are spatially spread over multiple satellites in formation flight with one single master and multiple deputy satellites. Furthermore, due to the extreme distance from the sun, RTG is one of the enabling technologies of the mission. In this paper, the overview of the mission, the spacecraft concept including the technical challenges mentioned above, together with their intended solutions are discussed.