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MELTING PROBE TESTS AS PREPARATION FOR EUROPA MISSION

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One technology that will be needed for the exploration of Jupiters ice moon Europa will be a device that is capable of melting its way through the satellite's outer ice crust, and down towards the putative ocean of liquid water. In order to understand the physical and chemical nature of the ice layers that constitute the Europan crust, as well as for analyzing any underlying ocean water, it will be necessary for such a probe to include a suite of scientific instruments including analytical instruments that are capable of determining the chemical and isotopic compositions of the constituent Europan materials.

While melting probes have successfully been used for terrestrial applications e.g. in Antarctic ice, the behavior in vacuum is different and theory needs confirmation by tests.

Thus, the planetary simulation chamber at DLR in Cologne has been used to perform a series of melting tests in cold (LN2-cooled) water ice samples. The feasibility of the method could be demonstrated and the energy demand for a space mission was estimated.