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## **Acoustic positioning system in ice for the Enceladus Explorer**

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The IceMole, a combination of melting and drilling probe, which is able to move and steer through ice and take samples while doing so, can be used to install instruments in ice. An improved design of the prototype developed by the FH Aachen, the Enceladus Explorer, could be used to explore water filled cracks on the Saturn moon Enceladus some day. Before starting a space mission to Enceladus the next step will be the exploration of the Taylor Glacier in the Antarctica. The probe will operate in this similar, smaller scale scenario in order to test the functionality of itself and its inner systems. The icecraft will be equipped in addition to an inertial navigation system with an acoustic positioning system. The acoustic system, composed of receivers in the probe itself and several emitters (pinger) on the glacier surface, will determine the position of the IceMole by measuring the signal propagation time and triangulation, which requires a solid knowledge of the propagation of acoustic signals in ice. Especially the characteristics of this glacier ice, such as the speed of sound and the acoustic attenuation length, which depend on the density and temperature of the ice, have to be known. A method to determine these properties during the operation of the IceMole will be developed.

In this talk we will give an overview over the project. We will present the status of the development of the acoustic surface system and we will show the results of first measurements in glacier ice.

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