UNIVERSITY OF COPENHAGEN

IGS

8th Ice Drill Symposium Copenhagen 2019

Contribution ID: **79**   Type: **Oral**

A New Hot Water Drill System for Antarctic Ice Shelf Investigation

Wednesday 2 October 2019 09:40 (20 minutes)

Mass loss of ice shelf is of great significance to a better understanding of the ice sheet dynamics and a more precise prediction of global sea levels. However, the melting processes and ocean currents beneath the ice shelf remain poorly understood. The hot water drill, a highly efficient drill technique, provides an opportunity to investigate the physical and chemical processes beneath the ice shelf. With the financial support from the Ministry of Science and Technology of China, a new hot water drill system has been successfully developed. Drilling test results show that the average drilling speed is >30 m h-1, and the diameter of the obtained borehole is >35 cm. The length of the main hose is 2200 m. In the following years, the hot water drill will be employed on Amery Ice Shelf to penetrate the ice at 9 sites with thickness varying from ~600m to 1800m (near the grounding line). Through the borehole, seawater and sediment beneath the ice shelf will be sampled. The ice core will be recovered from three layers of the ice shelf (i.e., the upper, middle and lower layers). In addition, CTD and ADCP will be installed beneath the ice shelf. Besides, the automatic weather station, surface mass balance observation system and the GPS will be set up near the drilling site. The data logging to a local disk will be performed, and the disk will be replaced annually.

Author: Prof. LI, Yuansheng (Polar Research Institute of China, Shanghai, China)

Co-authors: Prof. SHI, Guitao (Key Laboratory of Geographic Information Science (Ministry of Education), School of Geographic Sciences and Institute of Eco-Chongming, East China Normal University,Shanghai, China); Prof. TALALAY, Pavel (Polar Research Center, Jilin University, Changchun, China); Mr AN, Chunlei (Polar Research Institute of China, Shanghai, China); Mr FAN, Xiaopeng (Polar Research Center, Jilin University, Changchun, China); Ms JIANG, Su (Polar Research Institute of China, Shanghai, China); Ms MA, Hongmei (Polar Research Institute of China, Shanghai, China); Mr WANG, Rusheng (Polar Research Center, Jilin University, Changchun, China)

Presenter: Prof. LI, Yuansheng (Polar Research Institute of China, Shanghai, China)

Session Classification: Session 5