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BOREHOLE IMAGERY WITHIN AND BENEATH THE AMERY ICE SHELF

M Craven[1], D Rasch[1], R Brand[1], A Drinkell[1], S Donoghue[2], J Pedro[2]

[1]Australian Antarctic Divion and ACE CRC, Hobart, Tasmania, Australia, [2]Institute for Antarctic and Southern Ocean Studies and ACE CRC, Hobart, Tasmania, Australia

A video system with dual camera capability (sideward, and downward looking) was deployed within and below the Amery Ice Shelf, East Antarctica. Although the system had no real time image transmission capability, video imagery was obtained at two hot water drilled borehole sites AM03 (70° 33.67' S, 70° 19.93' E, 85.5 m, asl), and AM04 (69° 53.97' S, 70° 17.42' E, 71.0 m, asl). At AM03 the ice was 722 m thick, with an ocean cavity a further 617 m deep. This site had no accreted marine ice on the base of the shelf, and the imagery captures the exit from smooth meteoric ice in the borehole to the ocean cavity. Images of the sea floor with its moonscape appearance were also obtained. At AM04 the shelf thickness was 603 m, the lower 207 m of this being accreted marine ice, with an ocean cavity depth of 399 m. Here the deepest 50-55 m of the marine ice was a chaotic zone of accreted platelet crystals with cavities and pockets filled with seawater. Video imagery captured the jumbled nature of this region as the camera system was raised into the bottom of the borehole from the ocean cavity below. The sea floor was visited on two separate occasions: the first in zero current conditions where the soft silty material of the bed curled like wisps of smoke in the turbulence produced by motion of the camera and a krill swam close by; the second when a current drove particulate matter across the field of view, a jellyfish floated past, and a crawling organism was recorded on the sea bed.