



Ocean mixing beneath Pine Island Glacier Ice Shelf

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Ice shelves around Antarctica are vulnerable to increase in ocean-driven melting, with the melt rate depending on ocean temperature and strength of sub-ice-shelf-cavity circulations. We present repeated measurements of velocity, temperature, salinity, turbulent kinetic energy dissipation rate and thermal variance dissipation rate beneath Pine Island Glacier Ice Shelf, collected by CTD, ADCP and turbulence sensors mounted on an Autonomous Underwater Vehicle (AUV). The turbulence quantities measured by the AUV outside the ice shelf are in good agreement with ship-based measurements. The highest rate of turbulent kinetic energy dissipation is found near the grounding line, while its temporal fluctuation over seabed ridge within the cavity corresponds to the tidal fluctuation predicted in the Pine Island Bay to the west. The highest thermal variance dissipation rate is found when the AUV was 0.5 m away from the ice, and the thermal variance dissipation generally increases with decreasing distance between the AUV and ice.