

Passive Seismic Observations of Ice Stream Motion Near the Siple Coast Grounding Line

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During the 2003-2004 field season a geophysical survey was carried out to better characterize tidal influences on ice stream motion. As part of this project a series of passive seismic arrays were deployed near the grounding lines of ice streams B (Whillans) through E (MacAyeal) to monitor basal processes associated with GPS derived velocity variations. Preliminary results reveal distinct patterns and styles of basal seismicity on each ice stream, reflecting varying basal processes. Initial results are consistent with previous observations and models of tidal forcing.

These data show that ice streams with similar surface velocities accommodate motion by different basal processes, as observed near the grounding line of Ice Streams D and E. While these arrays were located only 25 km apart they exhibit dissimilar styles of seismicity. The differing spectral content of the waveform and the temporal pattern of icequake occurrence suggest that basal conditions beneath the ice sheet may change rapidly over very short distances.