Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Axisymmetric Ice Shelf Dynamics SAM PEGLER, M.G. WORSTER, University of Cambridge — West Antarctica is composed principally of marine ice sheets, in which the mainland (grounded) ice sheet extends over the coastline as a floating ice shelf. Fed by snowfall far upstream, these sheets transport ice from the grounded component, over the grounding line, where the ice shelf lifts off, and into the ice shelf, which ultimately calves and adds water to the ocean. An idealized two-dimensional ice shelf has no dynamical influence on the grounded ice sheet or the position of the grounding line. However, horizontal stresses within a three-dimensional ice shelf, caused for example by ice rises or the lateral walls of a bay, can help fix the grounding line and prevent it from receding. This study investigates theoretically and experimentally the dynamics of an idealized three-dimensional ice shelf which flows radially from a point source, to elucidate the controlling influence of circumferential stresses within the shelf.

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Date submitted: 14 Sep 2009 Electronic form version 1.4