Abstract Submitted
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The Hydrodynamics of Iceberg Capsize Near a Glacier Terminus J.C. BURTON, L.M. CATHLES, D.R. MACAYEAL, W.W. ZHANG, University of Chicago, J.M. AMUNDSON, University of Alaska Southeast, S. CORREA-LEGISOS, Centro de Estudios Científicos — Marine-terminating glaciers lose most of their mass into the ocean by calving icebergs. The largest icebergs are frequently observed to capsize as they calve, releasing enormous amounts of gravitational potential energy. During this process they may collide with the glaciers' terminius, producing teleseismic "glacial earthquakes" which can be detected by the Global Seismic Network. We use a combination of laboratory wave-tank experiments and numerical modeling to show that the contact and pressure forces exerted on the glacier terminus are strongly influenced by the hydrodynamics of the capsize process. In particular, we find that hydrodynamics can significantly increase the magnitude and duration of the contact force with the terminus, and that the earthquake magnitude, expressed as a twice-integrated force history, is not simply proportional to iceberg size. Our results highlight the difficulty of interpreting seismograms due to iceberg collisions.

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