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Turbulent convection and dissolution under sloping Ice-shelves in Saline water MAINAK MONDAL, BISHAKHDATTA GAYEN, The Australian National University, ROSS GRIFFITHS, Retired, ROSS KERR, The Australian National University — We have carried out numerical experiments with geophysicallyrelevant slope angles (5^o-20^o) over domains of O(1 m) -O(10 m) bracketingAntarctic conditions. Contact of the ice with cold and saltywater drives a turbulentbuoyant flow predominantly due to freshening from melting ice-interface in the upslope direction. The dissolution rate decreases with shallower angles and is predicted by our theory. Thickness of the thermal and salinity boundary layer increases with decreasing slope angle whereas the interface conditions remains insensitive to the inclination. The dissolution rate is independent of slope length when boundary layer is turbulent. For steeper angles turbulent kinetic energy is mainly produced by the buoyancy flux but it's contribution rapidly decreases with shallower angles. For shallower slopes turbulence is sustained by shear production due to decrease of velocity boundary layer. Our results can be used to explain many dynamical processes under inclined ice shelves around Antarctica.

Mainak Mondal
The Australian National University

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