1046-76-1687 **Esteban G. Tabak*** (tabak@cims.nyu.edu), Esteban G. Tabak, New York University, 251 Mercer Street, New York, NY 10012, and **Helga S. Huntley**. *An optmization approach to modeling sea-ice dynamics.*

A new model for the dynamics of sea ice is proposed, where the pressure field is computed, not from a local rheology, but from a global optimization problem. The pressure emerges as a Lagrange multiplier that enforces the ice resistance to compression while allowing divergence. The resulting variational problem is solved by minimizing the pressure globally throughout the domain, constrained by the equations of momentum and mass conservation, as well as the limits on ice concentration (which has to stay between 0 and 1). This formulation has an attractive mathematical elegance while being physically motivated. Moreover, it leads to an analytic formulation that is also easily implemented in a numerical code, which exhibits marked stability and is suited to capturing discontinuities.

A finite ice strength is incorporated into the model as a second optimization step, minimizing the change in ice thickness necessary to satisfy the upper bound on the pressure, whereby ice strength is taken to be a function of thickness. (Received September 16, 2008)