



A Labrador Sea modeling studied by a coupled sea ice-ocean circulation model

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Qualitative comparison between the simulated and observed fields in the Labrador Sea is performed. The mean horizontal circulation of the surface cyclonic subpolar gyre and recirculation of the mid-depth cyclonic boundary currents (Lavender et al., 2000) are relatively well simulated. The distribution of the eddy kinetic energy also shows good agreement with the observed results (for example, Brandt et al., 2004) over the surface in the annual average. Our model captures the observed typical vortical structures of a pair of vortices and a cluster of vortices offshore West Greenland (Prater, 2002), which is only achieved by use of eddy-resolving ocean circulation models. The vertical convection, on the other hand, is improved substantially. The mixed-layer depth is less than about 2000 m consistent with the observed evidence (for example, Pickart et al., 2002) over the Labrador Sea. Our model captures the wintertime convection columns.