



Impact of Surface Velocity Dependence of the Wind Stress on the Dynamics of the Southern Ocean

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This study aims at understanding the impact of including/neglecting the ocean surface velocity in the parameterization of the surface wind stress on the dynamics of the Southern Ocean using a realistic regional ocean model at eddy permitting resolution of 1/10 degrees in both longitude and latitude.

The influence of surface velocity dependence on wind work, Eddy Kinetic Energy (EKE), the Meridional Overturning Circulation and vertically integrated transport is examined by comparing model runs with both parameterizations. The sensitivity to the Southern Annular Mode (SAM) is addressed with different perturbed runs with added/subtracted SAM related wind anomalies for both parameterizations.

Preliminary results confirm that including the surface velocity dependence leads to a reduction of wind work and EKE, as expected from theoretical considerations. However, the results seem to refute an associated large increase in vertically integrated Antarctic Circumpolar Current transport found in earlier studies.