Geophysical Research Abstracts, Vol. 7, 05722, 2005
SRef-ID: 1607-7962/gra/EGU05-A-05722

Representing exchange through underresolved straits in ocean models

R. Hallberg (1,2), A. Adcroft (2,1)

(1) NOAA/GFDL, New Jersey, USA, (2) Princeton U., New Jersey, USA, (Robert.Hallberg@noaa.gov/Fax:609-987-5063)

Several important water masses are formed by the flow of waters from marginal seas. The straits through which these source waters flow are often much smaller than can be resolved by typical climate models. Here we demonstrate the dramatic improvements to GFDL's climate simulations that accrue from using partially open cell faces to represent the exchange of water through such straits. We also discuss the energetic considerations that dictate how these features should be introduced into the shallow water equations. Similarly, thin-wall barriers and vertically structured wall porosity offer the prospect of substantial improvements in the abyssal ocean circulation through otherwise unresolvable canyons.