Geophysical Research Abstracts, Vol. 7, 01232, 2005
SRef-ID: 1607-7962/gra/EGU05-A-01232

Thermocline associated mixing in seasonally stratified continental shelf seas

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A key process implicated in the shelf sea pumping of CO_2 to the open ocean is vertical mixing in the seasonally stratified regions of continental shelf seas. In an attempt to improve understanding of the climatology of thermocline mixing we present direct measurements of the rate of dissipation of turbulent kinetic energy (ε) and the subsequently inferred mixing rates from a variety of summer stratified locations of the Celtic Sea. Each site reveals significant levels of mixing within the seasonal thermocline which results from local shear instability. This is contrary to the conventional view that vertical mixing in shelf seas is dominated by boundary generated shear stresses. Spectral analysis reveals that shear in the thermocline is found at both M_2 tidal and near inertial frequencies. We will conclude with an investigation of the mechanisms driving shear within the thermocline.