Abstract View

Volume 15, Issue 2 (February 1985)

Journal of Physical Oceanography
Article: pp. 121–132 | Abstract | PDF (849K)

Mean and Turbulent Structures of the Oceanic Surface layer as Determined from One-Dimensional, Third-Order Simulations

Jean Claude André and Pierre Lacarrére

Centre National de Recherches Météorologiques (DMN/EERM), 31057 Toulouse Cedex, France

(Manuscript received June 15, 1982, in final form September 17, 1984)

DOI: 10.1175/1520-0485(1985)015<0121:MATSOT>2.0.CO;2

ABSTRACT

Various mechanisms that can drive the evolution of the oceanic surface boundary layer (OSBL) are numerically studied using a detailed turbulence-closure scheme. It is shown that stress and shear-driven regions are characterized by relatively poor mixing of momentum and heat, and by a local equilibrium at each level between shear production and destruction by viscous dissipation and buoyancy. Buoyancy-driven regions appear to be much more well mixed and to be characterized by counter-gradient turbulent diffusion of eddy kinetic energy. Consequences of these features for the parameterization and description of the OSBL are discussed.