



On the transformation of Pacific Water into Indonesian Throughflow Water by internal tidal mixing

A. Koch-Larrouy (1), Gurvan Madec (1), Pascale Bouruet-Aubertot (1), Theo Gerkema (2), Laurent Bessieres (3), Robert Molcard (1)

(1) Laboratoire d'Océanographie Dynamique et de Climatologie, France, (2) Royal Netherlands Institute for Sea Research, The Netherlands, (3) Laboratoire d'Etudes en Géophysique et Océanographie Spatiale, France (Ariane.Koch-Larrouy@locean-ipsl.upmc.fr / Fax : +33 1 44 27 38 05 / Phone : +33 1 44 27 84 74)

The Indonesian archipelago is characterized by strong internal tides, which are trapped in the different semi-enclosed seas of the archipelago. Using tidal model results a parameterization of the associated 3d tidal mixing is developed. The resulting average vertical diffusivity is $1.5 \text{ cm}^2/\text{s}$, which independently agrees with the estimates inferred from observations. Introduced in a regional OGCM, the parameterization improves the water mass characteristics in the different Indonesian seas, suggesting that the horizontal and vertical distributions of the mixing are adequately prescribed. In particular, the salinity maximum of the inflow water is reduced along the main route, mainly in the Dewakang sill area. But also it is erased in the Halmahera and Seram seas, the entrance of the eastern route, so that salty water doesn't penetrate the Banda Sea. As a result the simulated Indonesian Throughflow Water are in good agreement with observations.