



## **Shear generated turbulence in the natural environment**

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Shear generated turbulence is an important source of mixing in both the ocean and atmosphere. Often because of sampling difficulties we are limited to deriving statistical relationships between the turbulence activity and the larger scale properties of the fluid flow. The Western Equatorial Pacific proves to be an ideal natural laboratory to study shear generated turbulence. Here turbulent production is dominated by the shear associated with relatively long lived flow structures in the form of high vertical mode inertia-gravity waves and flow instabilities. With enough vertical resolution we can directly measure the characteristics of these flow features. We find a strong relationship between the vertical shear and stratification and the turbulent dissipation and implied vertical diffusion coefficient. In addition there is a strong indication from the our observations that the vertical mixing length scale is inversely proportional to the buoyancy frequency as found in numerical DNS and LES studies. The dataset is also an excellent test for parameterization schemes. We find with suitable modification that one such scheme is able to capture a good deal of the vertical variation of turbulent activity as well as variations between different sampling periods.