



Turbulence producing processes in a tidal channel

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Turbulence is important for mixing processes in the ocean. Especially in shallow water regions with high current velocities, e.g. in a tidal channel, vertical mixing is strong. The origin and continuity of turbulence depends strongly from Reynolds Stress τ and velocity shear S .

In the work presented, the Reynolds Stress τ and the velocity shear S were estimated using current measurements from a bottom-mounted high-frequency Acoustic Doppler Current Profiler (ADCP). The measurement was conducted at a Time Series Station in an East Frisian tidal channel in the southern North Sea. Data were collected during one tidal period in November 2010.

The comparison between the Reynolds Stress τ and the velocity shear S reveals a period, which is related to the quarter-diurnal pattern M_4 . The maximum values are located near the seabed. Therefore, turbulence is generated by sheared currents at the bottom of the sea. Thus, shear acts to increase turbulent mixing. Due to the shallow water depth mixing occurs across the entire water column.