Geophysical Research Abstracts
Vol. 12, EGU2010-15598, 2010
EGU General Assembly 2010

Lutocline Mixing and sediment wave interaction

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Coastal mixing induced by waves is modeled experimentally by means of an oscillating grid, [1,2]when the boundary layer is turbulent as when waves generated by a storm break and spill, or when wind interacts with wave stirring, then a strong turbulence lifts off bottom sediments and these often form a distinct sediment laden region capped by a sharp density interface called in this case a Lutocline. These particle layer may be transported to deeper regions by compensation or gravity currents[3,4].
Point velocity distributions created by wind, waves and sloping currents are dominated by breaker areas which act as strong attractors for the sediments in suspension, because at the same time there is a higher mean water level near the coast due to wave radiation[5]. The combination of offshore and onshore together with the longshore and crosshore strong currents due to wave radiation imbalance produce the strongest local shear induced morphological sediment transport. The use of a circular Couette flow to hold sediments in suspension using a vortex generator (producing shear) or an oscilating grid is used to investigate the parameter range of sediment lift off.

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