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Diffusion, intermittency and scaling in wave breaking turbulence

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Measurements of 3D turbulent velocity have been made near the coast for a variety of weather conditions in the wave breaking zone, and these values have been compared with flume measurements at a 100m long wave tank. There is a strong dependence of the integral lenthscales with the Wave Reynolds number as well as with the position and the wind, quantified through the friction velocity from wind profiles measured at the coastline. Earlier results have been published in Bezerra et al. (1998) and Rodriguez et al(1999). Several effects are important and give several decades of variation of eddy diffusivities measured near the coastline (between 0.0001 and 2 m2s-1)Inman et al.(1971), Zeitler(1976).

Measurements of electromagnetic and ADV velocity measurements of the Coastal wave generated turbulence are compared in order to invest the scaling and intermittency of the turbulence produced by wave breaking. The velocity measurements were performed with an array of electromagnetic sensors that could be placed along the coastline in a stainless steel sledge. Rodriguez et al.(1994,1999) showed a parabolic shape of cross-shore diffusivity values but present analysis also shows the crosshore dependence of the intermittency as well as changes in the spectral slopes.

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