



## Wind and Wave induced dispersion in the ocean

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A series of novel image analysis techniques have been used to study surf-zone hydrodynamics taking advantage of recent advances in digital processing of images taken from video recordings of the sea surface near the coast. The use of image analysis allows the estimation of both spatial and temporal characteristics of wave fields, surface circulation and mixing in the surf zone. The dispersion of blobs of dye released at different distances from the coastline under very different sea conditions is used to measure surface eddy diffusivities. A preliminary set of field measurements were done in the Ebro Delta where the methodology was tested. Further experiments have been performed at Vilanova, Spain and Recife, Brazil. There is an increase of diffusivity with wave height but only if the wave Reynolds number,  $R_w$ , is greater than 103. No such trend is observed for  $R_w$  greater than 106. The other important factors are wind speed and tidal and longshore currents. A series of novel image analysis techniques have been used to study surf-zone hydrodynamics taking advantage of recent advances in digital processing of images taken from video recordings of the sea surface near the coast. The use of image analysis allows the estimation of both spatial and temporal characteristics of wave fields, surface circulation and mixing in the surf zone. The dispersion of blobs of dye released at different distances from the coastline under very different sea conditions is used to measure surface eddy diffusivities. A preliminary set of field measurements were done in the Ebro Delta where the methodology was tested. Further experiments have been performed at Vilanova, Spain and Recife, Brazil. There is an increase of diffusivity with wave height but only if the wave Reynolds number,  $R_w$ , is greater than 103. No such trend is observed for  $R_w$  greater than 106. The other important factors are wind speed and tidal and longshore currents.

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