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Wind and Current Intermittency in Coastal and Atmospheric Environments

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We study at several non-homogeneous sites, such as the coastal Mediterranean Area (Ebro Delta, Blanes) and in the iberian Plateau the wind intermittency as well as the fractal structure of the induced cloud and wave fronts. Weather data from 10 and 100m hight masts are used to calculate Local Richardson number, Monin-Obukhov length, eddy transfer coefficients, turbulent kinetic energy, turbulent intensities, friction velocities and sensible heat flux at three levels (5, 17 and 32 m) were considered. The results show how the stability at 17 and 32 m influences the turbulent transfer near the ground. The shear of wind or convection are the main mechanism to produce mixing in the surface, which is often detected in satellite images of nearby clouds or coastal features. The influence of internal gravity-waves on the atmospheric boundary-layer during strong stable stratification is quantified.
atmospheric and oceanic circulation involve non-linear intermittency that account for unresolved turbulent mixing and diffusion.
The most sophisticated turbulent closure models involve using structure functions of higher order [1,2]. The relationship between the intermittency of turbulence and the type of stratification for different atmospheric situations during the SABLES98 field campaign. We first show that the scaling behaviour of the velocity structure function
in events such as GABLS (GEWEX Atmospheric Boundary-Layer Study)and in combined ESA SAR measurements [3-6] near the coast exhibit fractal and intermittent scaling. Near the Gulf of Lyons, vortical scaling show coupling between synoptic and rossby deformation scales [7].

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