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# Turbulent structures in rotating boundary layers.

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The developments of neutral boundary layers generated by two different roughness conditions in a rotating water tank are examined and compared. Measurements of the velocity field are obtained by means of the PIV (Particle Image Velocimetry) technique at high spatial and temporal resolution, which allows to obtain the turbulent field and to calculate the higher order moments of the turbulent velocities PDF. The trends of the skewness and kurtosis values with respect to the distance from the rigid boundary as well as the corresponding cumulants is observed in order to evaluate the departure of the PDF from the Gaussian approximation. Besides these quantities, accounting for the non-local character of turbulence, other fundamental aspects of the turbulent flow are investigated.

The transition between three-dimensional and quasi-two-dimensional turbulence is analyzed. The power spectrum, as a function of the characteristic wave number (or frequency), follows a typical exponential

law, with the exponent which tends to 3 as the Rossby number decreases. The structure of the flow in the boundary layer is investigated in term of vertical cross sections of vertical velocity and relative vorticity. This analysis highlight the presence of organized structures which are influenced by both rotation and roughness of the wall, in particular their behavior and evolution as the flow velocity approaches zero is considered.