Wake Interference in case of macro-scale roughness: preliminary observations

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ABSTRACT
The turbulent flow in the case of macro-roughness elements is strongly affected by the vortex structures which develop around the macro-elements and force the flow to deviate from the undisturbed uniform flow, for which the logarithmic law of the wall is assumed to be valid.

In this case macro-roughness element planimetric arrangement play a fundamental role in energy dissipation behavior. Indeed it seems that an optimal macro-roughness element spacing value exists, able to maximize flow resistance.

This special behaviour may be related to the transition from an isolated-roughness to a wake-interference flow.

This paper presents the preliminary results of a laboratory study on the flow around single test block and on the flow in the case of a row of test blocks, in order to evaluate the wake interference.

The velocity profiles are analyzed in order to reconstruct the flow field around the test block to the purpose of estimating the spatial evolution of a steady wake.

Keywords: wake, turbulence, macro-scale roughness.