DOROTHY, a software to compute turbines wakes in interaction with the account of ambient turbulence.

Grégory Pinon[*]

[*]Laboratoire Ondes et Milieux Complexes - Normandie Univ, UNIHAVRE, CNRS, LOMC, 76600 Le Havre.
gregory.pinon@univ-lehavre.fr

I. KEYWORDS

tidal turbine, wind turbine, wake, turbulence, interaction

II. ABSTRACT

The development of wind and tidal turbines arrays has been an active research topic for some years. However, many studies are still necessary in order to fully understand the behaviour of such arrays. One of these studies is the impact of ambient turbulence on the behaviour of wind and tidal turbines. Consequently, numerical simulations have to represent the ambient turbulence or at least its effects on the turbines performance and wake. The talk will present the latest numerical developments carried out at LOMC in collaboration with IFREMER in order to take into account the effects of ambient turbulence [1] and wake interaction [2].
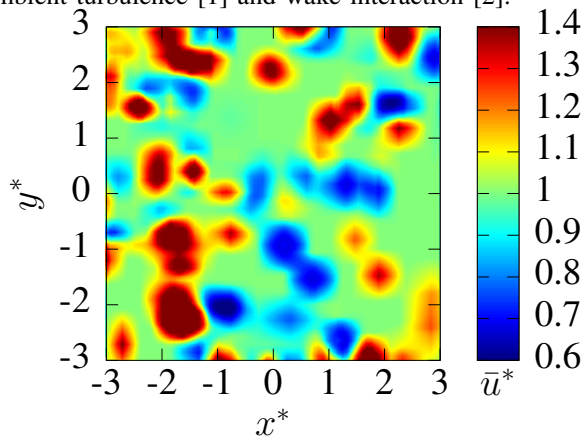
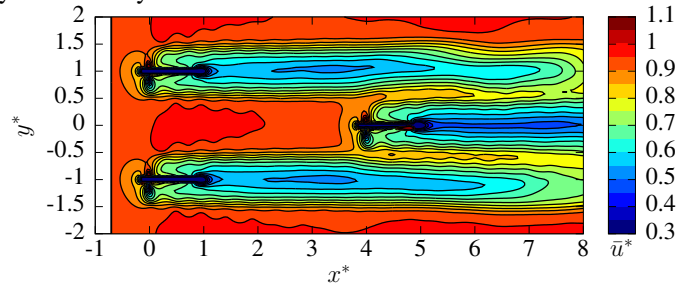Fig. 1 Example of generated ambient turbulent flow with the Synthetic Eddy Method.

Fig. 2 Example of 3 interacting turbines.

REFERENCES

[1] C. Carlier, G. Pinon, B. Gaurier, G. Germain, and E. Rivoalen. A synthetic eddy-method to represent the ambient turbulence in numerical simulation of marine current turbine. In *10th European Wave and Tidal Energy Conference (EWTEC)*, 6-11th Sept. 2015 2015. Nantes, France.

[2] P. Mycek, G. Pinon, C. Lothod, A. Dezotti, and C. Carlier. Iterative solver approach for turbine interactions: application to wind or marine current turbine farms. *Applied Mathematical Modelling*, 41:331 – 349, 2017.