

Abstract Submitted  
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**Determination of wind-turbine-wake centerline for the analysis of the wake-meandering phenomenon**<sup>1</sup> NICOLAS COUDOU, Universit de Mons, Universit catholique de Louvain von Karman Institute for Fluid Dynamics, PHILIPPE CHATELAIN, Universit catholique de Louvain, JEROEN VAN BEECK, von Karman Institute for Fluid Dynamics, LAURENT BRICTEUX, Universit de Mons — The oscillatory motion of wind turbine wakes, also known as wake meandering, is crucial in wind farms as it increases unsteady loading, in particular yawing moments, on downstream turbines. The study of this phenomenon requires, as a first step, the determination of the position of the wake. Therefore, the aim of this work is to compare different techniques to detect the wake centerline based on the velocity/momentum deficit inside the wake or on the estimation of azimuthal vorticity centroids. These techniques are applied to the data obtained from Large-Eddy simulations of the NREL 5-MW wind turbine. The computations were performed with a vortex-particle mesh code with the wind turbine rotor modeled by means of immersed lifting lines. This study constitutes a first step towards the understanding of meandering mechanisms and its accurate operational modeling.

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