

A quasi 3D computation of merging wakes using a boundary layer equation model approach

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Objective with the model: Computations of the integrated/merged deficit from several upstream turbines to be used in the DWM model with initial deficits derived from a BEM model approach.

Approach: The basic concept in the proposed approximate and fast model is to use a 2D BLE model in a horizontal plane and an AS-BLE model in a vertical plane for each deficit, where the initial deficit as in the present model is derived from the BEM model induction. Merging of the wakes is implicitly modeled with the 2D BLE model, where the computation can be extended over an arbitrary number of rows. For each deficit the 2D solution is locally coupled with the solution for the deficit in vertical direction computed with the axis-symmetric model. The coupling is done by enforcing a similar velocity from the two solutions at the centre of the released deficit using a coupling coefficient on the viscosity term in each of the two models.

Results:

