WESD

Interactive
comment

Interactive comment on "FLOWSTAR-Energy: a high resolution wind farm wake model" *by* Amy Stidworthy and David Carruthers

Amy Stidworthy and David Carruthers

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(Reviewer comments are labelled 'RC' and numbered with the reviewer number and the comment number; the author comments are labelled 'AC' and numbered the same way. AC2.1 is the authors' response to reviewer comment RC2.1 (the first comment from reviewer 2) etc.)

RC2.1: "It is unclear to the reviewer how to get the 'complete' flow field in the wakes (for example how to get results from Figs. 9 and 14). Is it my limit of understanding or the way the methodology is described/presented? I have read several times the paper and some of the references and I do not fully understand how the wakes are introduced in the flow using FLOWSTAR."

AC2.1: Earlier drafts of the paper included a more complete description of the plume

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model that underlies the wake model, but this section was removed to shorten the paper, in the belief that the referenced papers gave sufficient information on this aspect; however, from the comments from all three reviewers, it is clear that there is insufficient information in the paper on this aspect, so this section will be reinstated.

RC2.2: "Equation (7) is presented with no explanation how to get it and/or relevant references. It might be classical information for researchers at CERC but sufficient information should be provided to the readers. Complete information regarding the calculation of some parameters in equation (7) are missing. This makes the duplication and/or the verification of the results impossible."

AC2.2: The authors acknowledge that there is an issue here, which will be addressed by the inclusion of a fuller description of the plume model that underlies the wake model.

RC2.3: "In the validation section for the Tjaereborg 60m wind turbine, the results are averaged over the measurement heights (see page 7, line 27) without any discussion/justification. I would be curious to know why it is averaged."

AC2.3: The Tjaereborg results were averaged over the measurement heights in order to simplify the presentation of results, presenting 4 graphs instead of 16; however, all 16 graphs can be presented if this is preferred.

RC2.4: "Regarding the wind farm results, they are all obtained for off-shore setting. This is not complex surfaces justifying the use of FLOWSTAR. This is clearly mentioned at the end of the abstract and conclusion. I have appreciated to see this clearly stated. Nevertheless, why presenting FLOWSTAR then?"

AC2.4: The wake model is integrated with FLOWSTAR in FLOWSTAR-Energy; this first FLOWSTAR-Energy paper addresses the performance of the wake model in flat terrain and offshore. A subsequent paper will present validation of the wake model in complex terrain, as is noted in the abstract and in the conclusion.

RC2.5: "Please remove 'FLOWSTAR-Energy' from the title. It is not really necessary."

AC2.5: The title can be changed if this is thought necessary. However it is common to include model names in titles.

RC2.6: "Page 2, lines 26-28: there are errors in referencing."

AC2.6: Apologies, errors with links were introduced when the paper was re-formatted for Wind Energy Science; all links and references will be re-checked and corrected prior to re-submission.

RC2.7: "Page 3, line 24: Following 0 ????"

AC2.7: Apologies, errors with links were introduced when the paper was re-formatted for Wind Energy Science; all links and references will be re-checked and corrected prior to re-submission.

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