

Wind Energ. Sci. Discuss., referee comment RC2
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Comment on wes-2022-112

Anonymous Referee #2

Referee comment on "A new RANS-based wind farm parameterization and inflow model for wind farm cluster modeling" by Maarten Paul van der Laan et al., Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2022-112-RC2>, 2023

This paper proposed a wind farm model which works for RANS with relatively large CFD cell sizes. The model uses tabulated wind farm thrust coefficient based on precursor RANS-AD simulations and the Gaussian-function force distribution. Also, a new atmospheric inflow condition is proposed for the neutral condition based on analytical potential temperature profile. The analysis is comprehensive and the results look promising. The save in the computation time is significant. I believe this work is very good and meaningful, and, therefore, recommend acceptance with minor revisions, such as:

1. The abstract is too long, where SCADA is used without definition.
2. Line 186 and 187, the brackets of the citations are missing;
3. I understand that there are two sets of meshes, i.e., one is for CFD, and the other for the AWF model. But it is a little confusing when I was reading the paper. It would be better to make it more clear, such as adding a figure showing both the meshes and their relationship.
4. Around line 255, how are those RANS-AD simulations set up, such as domain size, grid resolution, boundary conditions, etc? Are they the same as the later RANS-AWF clustered case but only consider one wind farm at time? In the conclusion, it says a 80% saving even if RANS-AD is used as the precursor for a case consist of there wind farms. I assume for each wind farm, you have to run the RANS-AD for a series of wind speed and directions, then how can the combination of all those effort save anything from running a single RANS-AD case with all the three wind farms together? I suppose the precursor RANS-AD is way cheaper, but the manuscript is not clear about it. Please clarify.