

Wind Energ. Sci. Discuss., referee comment RC2
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Comment on wes-2022-63

Anonymous Referee #2

Referee comment on "From gigawatt to multi-gigawatt wind farms: wake effects, energy budgets and inertial gravity waves investigated by large-eddy simulations" by Oliver Maas, Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2022-63-RC2>, 2022

Review of WES-2022-63, 'From gigawatt to multi-gigawatt wind farms: wake effects, energy budgets and inertial gravity waves investigated by large-eddy simulations', by Oliver Maas

The author presents differences in flow effects induced by a 'small' (1GW) and a 'large' (10GW) wind farm by analyzing data from LES. Given the anticipated growth of offshore wind energy in the coming decades, the societal relevance is clear. Especially, as very large wind farm (clusters) may interact with the atmosphere in a different way than present-day sized wind farms. Studies like these contribute to the necessary understanding of multi-GW wind farm clusters.

The study itself is clearly written. Methods are neatly described. The figures are of good quality. The Conclusions are written in a balanced way (eg the final paragraph, where the author puts the results of his idealized case study into perspective).

Please find below just a few minor comments.

Minor comments:

279: "The drop in the perturbation pressure between these points is 7 Pa for the small wind farm and 21 Pa for the large wind farm (see Fig. 3)." I read other numbers from Fig 3 for the large wind farm. Please check numbers. Inserting 28Pa (like fomr the Figure) in eq 11 results in the indicated value of 11.0, in contrast to the mentioned 21Pa.

289: qualitative \square qualitatively

362: fix Park and Jensen citation

374: momentum equation is eq2, not 3

520: cs/g , should be cs^2/g