Review of the paper "Modelling of wind flows over realistic forests with LES".

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Recommendation: Minor revision.

Summary:

This paper presents a large-eddy simulation framework for modeling wind flow over realistic forested terrain using airborne laser scan data to derive detailed plant area density and topography. The topic is of considerable interest, and the methodology is robust. This paper makes a contributions to the field of wind energy by quantifying how terrain and vegetation heterogeneity influence wind flow and turbulence characteristics relevant to wind resource assessment. However, several issues must be addressed before the manuscript can be recommended for publication. My comments are categorized as either 'Major concerns' or 'Minor concerns', with the former focusing on conceptual technical critiques, and the latter highlighting grammatical and spelling errors.

Major concerns:

- **(1)**: Please emphasize more clearly in the Introduction how this work advances beyond earlier studies such as Ivanell et al. (2018), Arnqvist et al. (2019, 2024), or Boudreault et al. (2017). A short paragraph summarizing specific new insights would strengthen the positioning.

- **(2)**: The discussion in Section 2.1 provides useful scaling arguments, but the justification for the selected simulation length (20,000 s) would benefit from including convergence diagnostics, such as the time evolution of the mean and variance at representative heights. It would also be helpful to express the simulation duration in terms of large-eddy turnover times, which would facilitate comparison and reproducibility by other researchers.

- **(3)**: The formulation of the additional subgrid dissipation term ("spectral short-cut") is clearly described. It would be helpful to show its quantitative impact—for example, a comparison of vertical profiles with and without the term for one case (perhaps as supplementary material).

- **(4)**: The fixed drag coefficient Cd=0.2 may not capture species or height variability; a short justification or sensitivity test could be valuable.

- **(5)**: The footprint analysis (Section 6.3) provides interesting insights regarding upstream influence. This is a strong result—consider relating it to prior footprint models to highlight consistency or differences.

Minor concerns:

- **(1)**: Ensure consistency in the reference list—some entries include DOIs while others do not. Please include DOIs for all references where available.

References