

## **Review: A parameterization scheme for the floating wind farm in a coupled atmosphere-wave model (COAWST v3.7)**

I appreciate all the author's comments and changes to the manuscript. The manuscript improved considerably, but I believe there are still a couple of points that need to be addressed more thoroughly.

### **Major Comments:**

1. Modifications to momentum equation:
  - a. Momentum source: In the response to reviewers' comments, the authors argue that sub-grid momentum fluxes may be misrepresented when modeling floating wind turbines in mesoscale models. This is a valid and interesting hypothesis. However, the authors do not provide evidence to support this statement. More important, the authors do not provide evidence/references in their manuscript to justify adding a source of momentum and an explanation of why this source of momentum is added to the lowest 100 m. Making such a statement without referencing other work that highlights this problem would require either observational or high-fidelity simulation results. This is a crucial part of this manuscript that needs to be addressed prior to publication as it has first-order effects on wake recovery and, thus, on the power output of the model.
  - b. Depth of momentum source: In the response to reviewers' comments, the authors argue that they add the source of momentum in the lowest 100 m of the atmosphere because this is the depth of the surface layer (constant flux later). However, the surface layer depth changes constantly, as the authors imply in Figure R22 where the depth of the surface layer is assumed to be between 50 and 100 m above the surface. For instance, for some stably stratified flows, the surface layer may be a couple of meters in depth and the boundary layer may be about 100 m in depth. Therefore, this assumption does not hold for simulating realistic atmospheric flows. Like I mentioned in the previous comment, making this assumption without referencing prior work would require observational evidence or results from high-fidelity simulations.

### **Minor comments:**

1. It is not clear from Figure 10 that the FWFP simulations can produce lower power output compared with Fitch. From a visual inspection, Figure 10a does not have any clear red contours, which presumably mean Fitch produced more power than the FWFP. Also, the color bar on Figure 10b only has positive values. Why are there red contours in Figure R23, but there aren't any (at least not discernable) in Figure 10a?