Wave-atmosphere interactions are crucial for accurate weather and climate prediction. In this study, the authors developed a sigma coordinate system within the PALM model that directly resolves wave phases. Several case studies are employed to demonstrate the model's results. This modeling tool holds significant potential to provide deeper insights into wave-atmosphere interactions and to benefit the broader research community. Overall, the paper's structure is clear and easy to follow. However, the verification of the model results needs to be strengthened before I can recommend publication. Detailed comments are provided below:

- Section 5: Do you include the roughness length used to describe the drag from unresolved small-scale waves riding on the larger-scale resolved swell, as done in Peter Sullivan's model? If so, what is its value?
- Figure 3: When comparing your results for the OW case with those from Sullivan's OW case (Fig. 6 in their study), your results exhibit much larger wind fluctuations that extend to a much higher layer. Why is this?
- Wind profiles comparison: Your wind profiles for the OW and SW cases show substantial differences. However, in the results from Sullivan's code, these two experiments exhibit only small differences in the wind profile (See their Fig. 10). I suggest that the authors compare their model results with previous LES/DNS simulations to verify their findings.
- Energy budget: Did you check the energy budget of the LES simulations? Are they closed?

Minor comments:

- Page 9: L188: A is not defined
- Page 11, L240: A is wave amplitude, not wave height, right?
- L340: marine atmospheric boundary layer has been defined as MABL. Use it
- In Fig. 8, TKE_w should not be used for the wave kinetic energy, which is misleading. It should be WKE.
- Figure 4: I suggest changing the colormap in the left panel. As it stands, it is not easy to discern at which height the wind approaches the geostrophic wind described in the text.
- Y-axis clarification: Is the y-axis used in your figures based on height above the mean sea surface level or above the wave surface?

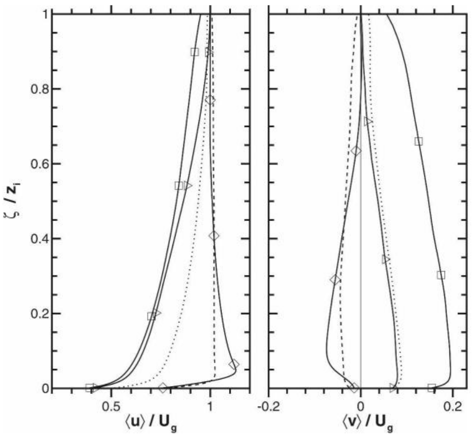


FIG. 10. Vertical profiles of the horizontal components of the mean wind $\langle \overline{u} \rangle$, $\langle \overline{v} \rangle$ for flow over waves. The spatial averaging is carried out along constant $\zeta$ surfaces, where $\zeta$ is the mean height above the wave. The nominal boundary layer depth $z_i$ = 400 m. The cases are as follows: dotted line, no waves; squares, stationary bumps; diamonds, wind following waves; triangles, wind opposing waves; and dashed line, slight convection with wind following waves.

Sullivan, P.P., Edson, J.B., Hristov, T. and McWilliams, J.C., 2008. Large-eddy simulations and observations of atmospheric marine boundary layers above nonequilibrium surface waves. *Journal of the Atmospheric Sciences*, *65*(4), pp.1225-1245.