General comments:

This paper presents a valuable dataset comprising forces, plant motions, free surface elevation, velocity profiles, and kinetic energy measured during laboratory experiments involving waves, following currents, and flexible vegetation. This dataset serves as a valuable resource for validating numerical plant dynamic models and gaining insights into the mutual effects between vegetation reconfiguration and wave / flow dynamics.

Reply

The authors thank the reviewer for acknowledging the value of our paper and data.

Specific comments:

1. This study emphasizes the significant contribution of leaves to the plant resistance and, consequently, the wave energy dissipation. It is crucial to note, however, that this assertion holds true when the leaves exhibit a certain level of rigidity, as indicated by the Young's modulus in Figure 2. Zhu et al. (2023) highlighted that the contribution of leaves to wave damping is influenced by leaf-related parameters, including the population density and leaf rigidity. Given the considerable spatial variability in leaf rigidity, even within the same species (i.e., Spartina alterniflora), it is necessary for the authors to acknowledge the potential restrictions associated with this statement.

(Reference: Ling Zhu, Qin Chen, Yan Ding, Navid Jafari, Hongqing Wang, Bradley D. Johnson, 2023. Towards a unified drag coefficient formula for quantifying wave energy reduction by salt marshes, Coastal Engineering, 180, 104256.)

Reply

Thanks for recommending this relavant publication. Yes, the contribution of leaves depends on the leaf rigidity, geometrical properties, and the number of leaves per bed area. We agree that these parameters could vary significantly in the field, and we agree with the recommendation of Zhu et al (2023) that these parameters should be measured in future field studies. We have addressed these points in **Line 63** "the rigidity and geometrical properties as well as the density of the leaves and stem affect the drag and hence the wave dissipation by the plants (Zhu et al., 2023)" and **Line 72** "The plant rigidity, morphology, and spatial distribution vary significantly in the field, which makes the estimation of plant drag and wave dissipation difficult in practice. Fortunately, average values of plant properties have been shown to produce reasonable estimation for field measurements of wave dissipation (Zhang and Nepf, 2021b; Zhang et al., 2022, 2021; Zhu et al., 2023)"

2. The vegetation motion videos are valuable. What is the size of red box in the background of videos? Knowing the size of red boxes can help readers to understand the magnitude of deflection.

Reply

Thanks for pointing out the missing information. The distance between the two red lines are 10 or 5 cm. To give a more detailed scale for the videos, we now added the videos shot with a ruler next to each model plant in the video link (https://doi.org/10.6084/m9.figshare.24117324). Note that the videos with a ruler were shot with the same window as the corresponding model plant. This additional information was added in **Line 521**.

3. Line 310-311: it is not straightforward to draw the conclusion of "sheltering and interaction among the leaves and stem decreased the force exerted on the full plant compared to the leaves and stem" from Fig. 6a.

Reply

To make a clearer connection, we modified the sentence in **Line 328** to "The force measurements suggested that the force on the full plant was smaller than the sum of forces on all the leaves and stem acting alone, suggesting that sheltering and interaction among the leaves and stem decreased the force exerted on the full plant compared to the leaves and stem in isolation (Fig. 6a)".

4. Fig. 6a: model and stem use very similar symbols, making them hard to distinguish.

Reply

We apologize for the choice of symbols. We modified Fig. 6 so that it is clear.