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Interactive comment on "The motion of trees in the wind: a data synthesis" *by* Toby D. Jackson et al.

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Thank you for your positive feedback and constructive review of our manuscript. Also, thanks for reading the other comments and our responses. This interactive review format is really helping the process. Please find our responses below:

1 Thanks for pointing this out. We mention the factor "tree type" to emphasise that it didn't explain much of the variation. I should also have included a reference to the supplementary materials here, since S4 contains a more detailed description of these models. I will expand the table in S4 to include the first 10 most important variables in each case. The short answer is that most of the important variables were from the catch22 feature set except for the fundamental frequency in the model for height, and the power spectrum slope in the model for DBH.

Tree age was not included because we didn't have this information for most of the trees in our study. Many of the trees are in natural forests or parks and we don't know their age. In some cases (e.g. Puerto Rico data set) it is very difficult to measure tree age due to the lack of distinct tree rings. However, this information may be useful for people using the data in future. I will ask the contributors to include it, where available, in the meta-data alongside the tree motion data deposit.

2 and 3 Yes – thank you for spotting these mistakes, we will correct them in the revised version.

4 and 5 Yes, the wind environment will depend on canopy structure so there will be differences between forest types and between forest and open-grown trees. This has implications for the clustering analysis (figure 3) but not for the changes over time (figure 4). Specifically, the clustering we observe is potentially due to both the similarities in tree motion between tree types as well as similarities in the wind environment.

We state this limitation in lines 275-277, 325-333 and 360-365. We will make this clearer by updating line 328 to: 'This regularity could be related to the wind environment (i.e. a turbulent wind environment over a rough forest canopy leading to lower regularity in wind loading) as well as the properties of the tree. Therefore, the observed clustering could be due to similarities in the wind environment as well as similarities in the tree response'.

6 We will add: 'At very low wind speeds the tree motion will be small and noise from the sensors may be significant. However, we do not believe that this trend is driven by noise since many of the sensors were extremely sensitive and the trend is similar across all data sets.'

7 We didn't have tree age data for the trees in this study. There is some interesting work showing that wind damage risk changes with age in a conifer plantation (increasing with age initially and then decreasing) but we could not conduct a similar analysis here. Incidentally, many of the forests are mixed species with very different age – size

relationships.

8 We are not aware of any data set like this, but it would be a good way to test it. It would be important to get a sufficient sample of different size trees in both types of course.

9 We will rephrase line 438 to 'However, we could not reliably distinguish open-grown broadleaf trees from forest broadleaves based on their motion in the wind.'

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