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Ocean Science
Discussions

Interactive comment on "Effects of current on wind waves in strong winds" *by* Naohisa Takagaki et al.

Anonymous Referee #1

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This is a nice paper, and the agreement between the observations and the nonlinear dispersion relationship theory was particularly satisfying. I do have a number of suggestions and comments below, which I would like to see addressed to strengthen the paper further.

1. Line 26 (and 357): Statement "The results show that 27 different types of currents" is confusing, as it implies there are 27 categories of currents this study uncovered. I am guessing authors meant that this study investigated 27 cases with carrying winds, waves, and currents.

2. Line 44-45: maximum ocean surface current velocity is certainly more than 1 m/s.

3. Introduction: Other than the high winds and the lack of data, the introduction seems

to be missing a scientific objective or a hypothesis. Please elaborate what reasons did the authors have to doubt that waves might not follow the dispersion relationship in high winds. Why wouldn't they?

4. Table: How were U10 and U* calculated from the wind speed measurements in the tunnel? This question becomes especially intriguing as wind speed studied here goes far beyond applicability limits of any Cd parameterization.

5. Table: What is freestream wind velocity? How is it defined and calculated?

6. Methodology: Paper's conclusions could have been reached based on a single tank experiment. Why use three tanks? Is that because no single tank had all required capabilities (e.g., high wind vs current control, etc.)? Please add an explanation in the methodology section.

7. Lines 98-99 How was the phase speed Cs calculated? Lines 98-99 mentioned some "cospectra method" and refer to Takagaki et al., 2017, but I looked through that article and did not find it. I think this method should be presented in greater detail in this manuscript. It is important to understand if the underlying currents, including the surface drift current, as well as the observed sharp vertical profile, might skew this estimate.

8. Line 133: What is an "open tank"? Please explain in the manuscript.

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