

Nonlin. Processes Geophys. Discuss., referee comment RC1  
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## **Comment on npg-2021-1**

Anonymous Referee #1

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Referee comment on "Enhanced internal tidal mixing in the Philippine Sea mesoscale environment" by Jia You et al., Nonlin. Processes Geophys. Discuss.,  
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The paper deals with an interesting and important problem, namely the mechanism(s) responsible for oceanic mixing in a topographically-complex region. The data have been processed satisfactorily and they show some interesting features, though the interpretation of these features is not straightforward. My principal difficulty with the paper lies in the analysis of the data and the validity of the conclusions drawn from such an analysis. The heart of the analysis is the correlation of observed features of the diapycnal diffusivity patterns with the main causes of mixing identified by the authors. Many of the correlations claimed by the authors seem to be based either on visual inspection of the data plots or analysis based upon ratios of the energy fluxes associated with each of the driving agencies (e.g Fig 4) . I did not find these analyses convincing and I would have appreciated some more quantitative and rigorous data correlation procedures carried out to justify the conclusions. Figs 6, 7 and 8 are very difficult to interpret. Overall, I found the data analysis to be rather superficial and, in consequence, the conclusions unjustified by the evidence of the data analysis.

There are a few typographic and/or grammatical errors but, in general, the standard of english is satisfactory. The main error is to use "rates" instead of "ratios" in the correlation analyses (line 250 and elsewhere). The use of "slopes" instead of "ratios" (e.g line 319 and elsewhere) is misleading also (if I have understood the text correctly). In equation (3) I assume that "acrcosh" should be "arccosh"?