

Interactive comment on “Consistency between Fourier transform and small-volume few-wave decomposition for spectral and spatial variability of gravity waves above a typhoon” by C. I. Lehmann et al.

Anonymous Referee #2

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Review of Consistency between Fourier transform and small-volume few-wave decomposition for spectral and spatial variability of gravity waves above a typhoon by C. I. Lehmann et al.

General Comments The paper presents a new, intuitively appealing technique (S3D) for deriving gravity wave momentum fluxes from spatially restricted data samples. The authors apply this technique to results from a high-resolution regional model containing gravity wave generated by a typhoon. Fluxes from S3D are compared with those from other standard techniques. Most of the paper is clearly written, and the general

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soundness of S3D seems confirmed.

I have only one substantive criticism of the study. When exploring a new technique like S3D it is often instructive to test using simple idealized situations in which the nature of the flow is easily understood. The WRF simulations used here are every bit as complicated as real atmospheric flows. It is good to see that S3D performs well in these situations, but there is scant guidance on why the technique works so well, at least above 25 km. Is it because the gravity field has had time to disperse into locally well-separated Fourier components? Will the technique work well when the wave disturbance is packet-like, say close (horizontally) to a mountain source? I imagine the authors have done some idealized studies. Perhaps they could comment on them.

Specific Comments p.1771 line 8. Here it says S3D momentum fluxes use Eq (2) a T' based calculation. Yet , all figures show “S3D on winds” as well as, “S3D on temp.”. What is going on?

p. 1772 line 20-, discussions of Fig 1 and 2. There should be some more description of the various techniques used to calculate momentum flux. What is the “direct wind. 360km” technique? Why does it differ from the “FT on wind” etc.

p. 1774, lines 8-, discussion of Fig 3 and 4.. I can't tell what the radial coordinate in Figs. 3 and 4 is supposed to be. Add labels with units etc..

p. 1774, line 24. I have difficulty finding the “pig tail” referred to in the text. Maybe a box around this feature could be added to the figure.

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 1763, 2012.