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Interactive comment on “Horizontal divergence of typhoon-generated gravity waves in the upper troposphere and lower stratosphere (UTLS) and its influence on typhoon evolution” by S. H. Kim et al.

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Received and published: 30 December 2013

General Comments: Paper entitled “Horizontal divergence of typhoon-generated gravity waves in the upper troposphere and lower stratosphere (UTLS) and its influence on typhoon evolution” by Kim et al. presents interesting characteristics of the horizontal divergence induced by typhoon-generated gravity waves (HDTGW) and the influence of HDTGW on typhoon evolution. The current paper by the authors is a sequential development in understanding the mechanisms that operate between typhoon and generated wave system, this work further provides answers to some of the questions which remained in the work taken up by Kim and Chun (2010, 2011). Findings are based on

C10514

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the simulation results of Typhoon Saomai (2006) using the Weather Research 5 and Forecasting (WRF) model. The power spectral density of HDTGW shows dominant powers at horizontal wavelengths of 20–30km and at periods of less than one hour. In addition, another prominent mode was also found with period of ~ 24 hour. Analysis have further confirmed that wave mode with 1- hour period is associated with the convection of inner core region of the typhoon, while 24-hour wave mode is different and belongs to Inertia gravity wave category that have source in the convective clouds of the spiral rainbands. Asymmetrical structure found in the typhoon generated gravity waves is also highlighted.

In the paper, a serious attempt is made to correlate the typhoon generated gravity waves (TGW) and their role in contribution to horizontal divergence of the outflow, and specially to examine the imbedded feedback process between TGW and its sources. Language of the paper is well understood and smooth. By looking at the findings and the serious efforts made in the paper to resolve the issue of HDTGW and typhoon evolution, I recommend the paper to be accepted in ACPD with some minor comments given below:

Specific Comments:

In the last paragraph, more clarity or a statement is expected about the relative contribution or comparison of short period gravity waves (with 20-30 km horizontal wavelength) with that of ~ 24 h wave (with large horizontal wavelength) to the horizontal divergence or the interaction between them. As mentioned in the paper that domain averaged HDTGW (indicating short period gravity waves role is minimized) the feedback seems active between large period gravity wave and the horizontal divergence. It is apparent the interaction is two way process and may be difficult to speak about the cause and effect, however a tentative statement may be given at this stage about the time -evolution of the typhoon once the inertia gravity wave is produced.

Technical Comments: I think use of HDTGW is more precise than HDTGWs in the text.

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Page 4, L 6, Year of the typhoon after the date may be mentioned. Page4, Correction L10, 12:00UTC 8 → 12:00UTC 8 August (or Aug), without mentioning month seems incomplete. Make it uniform at all places in the text. Figure 1: Font size of Fig (s) is too small and be increased proportionately. Page 9, L 12-14 - the reason is not known ? Page 13. L6, Already, acronym HDTGW is defined, no need to define again. Pahe 14. L9, azimuthal angle →varying azimuthal angle

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 28953, 2013.

ACPD

13, C10514–C10516,
2013

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C10516

