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Earth System Dynamics
Discussions

Interactive comment on "Organization of Dust Storms and Synoptic Scale Transport of Dust by Kelvin Waves" *by* A. K. Pokharel and M. L. Kaplan

Anonymous Referee #1

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An attempt is made to investigate the role of Kelvin waves in the development of dust storms for three cases involving orography, with the aid of WRF model simulations and satellite images. Despite the fact that I recognize that the investigation of this role is very interesting, my basic comment is that the analysis lacks of important evidence of the development of Kelvin waves. More specifically: 1. The authors support their statement on the temperature distribution of Figure 6 and geopontential in Figure 7 and vertical cross sections of potential temperature in Figure 8. First of all, these distributions are very messy and it is hard to recognize any patterns. Second, I think that the waves should be identified as streamline patterns or as geopotential anomalies or as anomalies of meridional wind. These plots are missing. Similar comment for the third case 2. Page 7, lines 30-35: The station locations should be displayed on the

map. Similarly with other locations referred in the manuscript 3. Section 2.2: I do not understand the reason for simply mentioning the finding that in the second case there is no evidence of development of Kelvin waves. The authors should get a better insight to investigate the reason for this, since the three cases are selected based on common criteria, involving the presence of orography. For instance, a first explanation could be related with the simulation of the case or with lack of data as compared to the other two cases. If not, the role of the orography is very likely to play a different role in this case. 4. I think that the structure of the paper should be modified. Section 3 should involve the Harmattan dust stom (3.1 Observational and model analysis, 3.2 WRF simulations) Section 4 should involve the second case and Section 3 the third case. 5. The conclusions are very poor and should be extended.

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