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Interactive comment on "Revisiting the Steering Principal of Tropical Cyclone Motion" *by* Liguang Wu and Xiaoyu Chen

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Major comments: 1. The author chose Matsa as a case to investigate the role of steering. However, In Fig.2, Matsa appears as a highly asymmetric typhoon after 24 hr of simulation. Since other processes such as VA and DH can cancel each other due to the coherent structure of the TC, it is confusing that VA and DH term of Matsa can also cancel each other because the structure is highly asymmetric. Please clarify this issue.

2. This paper did not provide the track and intensity, and structural changes of the simulated TC. Meanwhile, since the TC structure is highly asymmetric, and the TC center is defined as the geometric center of the circle. How different the center would be when using other methods to define the center, such as sea level pressure center,

PV weighted center, or streamline center? The definition of the center is very crucial because it will affect the results related to trochoidal motion.

3. The change of RMSEs of the speed and direction decrease with time. It's not intuitive to have larger error in the initial time while the error decreases later. What is the possible cause of such a result?

4. The concept of steering flow is very confusing, since there so many words like conventional steering flow (line 43 and line 243-246), steering effect (line 242), the steering effect of HA1 (line 248). Please rephrase all these to make it clear. Also, the reviewer cannot figure out the relationship between HA1, HA2, and steering flow. Please clarify.

5. Correct me if I'm wrong. HA=HA1+HA2 If this is right, in Fig.7, HA1+HA2 would not be HA.

6. Line 272 In Fig.8, the maximum (minimum) HA1 is in the entrance (exit) of the flow, but the statement in line 272 is the opposite. What is wrong?

7. Line 285-286 What does it mean "the individual contributions can cancel each other due to the coherent structure of the TC." Is the structure coherent?

8. Since the relationship among the terms of HA, VA and DH are nonlinear, is it fair to calculate the correlation of these terms and make interpretations?

9. Line 297-299 The reviewer cannot get the point of this explanation. Please provide further details. Regarding the statement, "The contribution of the HA term is negatively correlated with those of the VA and DH term", please provide more supporting evidences.

10. The author did not provide specific answer to the question when steering plays a dominant role, and when TC motion deviates from the steering. The reviewer can only tell that the small-amplitude trochoidal motion results from asymmetric dynamics of the TC inner core. This answers "why" TC motion deviate from the steering, but not "when"

TC motion deviate from the steering.

Minor comments:

Line 38, "paradigm" is not a suitable word here. Please change "potential vorticity tendency (PVT) paradigm" to "potential vorticity tendency (PVT) diagnostics".

Line 207 . . .. . . speed of -1.02 (-1.01) m/s. . . ... What does it mean to mention -1.01?

Line 201 What is secondary steering flow?