

Reviewer of "Dynamics of the Asian Summer Monsoon Anticyclone: Insights from Potential Vorticity Tendency Diagnostics" Written by Li et al., (Second Round Review):

The revised manuscript has been substantially improved compared with the previous version. The authors have carefully addressed many concerns. In particular: The vortex tracking section has been condensed and clarified with bullet points. The PV tendency framework has been simplified using isentropic coordinates. The discussion of ERA5 heating terms has been expanded. Figures and captions have been improved. The manuscript readability has significantly increased. The topic remains scientifically relevant and suitable for WCD. However, several minor but important issues require further clarification before the manuscript can be considered for publication.

1. ERA5 non-radiative heating still introduces uncertainty. Although the authors have expanded the discussion and corrected the previous plotting error, the ERA5 treatment still differs conceptually from MERRA-2 and JRA-3Q. Please consider to discuss the uncertainty this introduces into Figures 7--9 and the associated conclusions.

2. Line 171: Physical interpretation of the PV tendency decomposition remains insufficient. The revised manuscript introduces Eq. (5) as the central diagnostic framework. However, the physical meaning of several terms and the underlying assumptions remains somewhat ambiguous. Specifically:

Why is only the zonal flow decomposed into a mean and perturbation component? The manuscript states that "the time-mean background flow along the rideline is defined to be zonal ($\bar{v} = \partial \bar{P}\bar{V} / \partial x = 0$)" but the justification for this assumption is not fully explained. Is this valid throughout the entire ASMA domain, or only near the vortex centers? The ASMA is embedded in a complex flow that includes both zonal and meridional gradients, particularly near the flanks of the anticyclone where meridional flow is strong.

Is the last term correct? In Eq. (5), the final term is written as: $-(\bar{P}\bar{V} + P V') \frac{\partial \dot{\theta}}{\partial \theta}$. However, based on the standard PV tendency equation, the diabatic source term should be: $+(\bar{P}\bar{V} + P V') \frac{\partial \dot{\theta}}{\partial \theta}$. Please confirm whether this is a typo in the manuscript.

3. Line 151, the isentropic mass density is defined as: $\sigma = -g \frac{\partial p}{\partial \theta}$. In standard atmospheric dynamics, the isentropic mass density is defined as: $\sigma = -\frac{1}{g} \frac{\partial p}{\partial \theta}$. Please confirm.