

## **A review report on “DynVarMIP: Assessing the Dynamics 1 and Variability of 2 the Stratosphere-Troposphere System” by E. P. Gerber and E. Manzini**

Recommendation: Minor revision

### **General comments:**

The paper presents purposes and strategy of DynVarMIP. The importance of the momentum and energy budget of the atmospheric circulation for decreasing uncertainty in projections of future climates including regional climate, precipitation and extreme events responding to natural and anthropogenic forcing is documented. The strategy for the diagnostics is also concretely described. This activity is relevant to WCRP grand challenges mainly on “Clouds, Circulation and Climate Sensitivity”, and additionally on “Climate Extremes” and on “Biospheric Forcing and Feedbacks”. The description is relatively concise and clear. I think that this paper has a value to be published in Geosci. Model Dev. However, I have minor comments which may make this paper clearer and more easily understood for general readers as well as modelling scientists. Thus, I recommend minor revision before being accepted for publication.

### **Comments**

ll. 24-34: The authors mainly emphasized the importance of research on the mid-latitude storm tracks. However, it is also important to examine waves with various scales in various latitudes evenly because all these waves as well as convection and boundary layer processes are interacted with each other and affect the atmospheric circulation. This point should be discussed in more detail.

l. 40: Cumulous convection is also an important parameterized process. This process is related to generation of resolved waves particularly in the tropical region and hence indirectly contribute to the momentum budget of the middle atmosphere. This point should be discussed.

ll. 93-96: A reference is necessary, which describes details of DECK experiment, preindustrial control, abrupt 4x CO2 and 1pctCO2 etc.

l. 291: What CMOR is an abbreviation for?

ll. 313-372: Equation numbers should be added.

ll. 374-385: Equation numbers should be referred to.

l. 518: It is better to add the formulae and/or equation numbers in the table. For example, “tendency of eastward wind due to TEM northward wind advection and the Coriolis term” may have some ambiguity (i.e.,  $-f\bar{v}^*$  or  $-f\bar{v}$ ).

## **Others**

- I. 209: Remove the second “.”
- II. 333 A space is needed after  $\nabla \cdot \mathbf{F}$ .