

Review of "Circulation responses to surface heating and implications for polar amplification"

General comments:

The authors have adequately addressed my previous comments. I recommend the manuscript be approved for publication on the condition that they address my follow-up comments below.

Specific comments: (line numbers refer to the tracked changes version)

Line 114-115: Here you state u and E are individually vertically integrated quantities and also that $\text{div}(uE)$ is the divergence of vertically integrated moist static energy. This implies that $\text{div}\langle u \rangle \langle E \rangle = \text{div}\langle uE \rangle$, where $\langle \rangle$ denotes the mass-weighted vertical integral. I don't think this is generally true. I suggest you explicitly show where the vertical integral operator is in the equation and remove the prefix "vertically integrated" when describing u and E .

Line 117: Moist static energy does not include kinetic energy, hence the label "static" energy.

Line 241-243 and 269-272: The way these statements are phrased implies a direction of causality that the weaker circulation response drives the larger radiative cooling response. Do you have evidence to support the direction of causality? If not, I suggest rephrasing to eliminate the implication of causality; e.g., "The weaker circulation contribution in the high latitudes is *associated with* a stronger radiative cooling contribution."