

I am extremely disappointed by the argumentative and imperious nature of the authors' response to my review, which feels very much like an attempt to intimidate me as a reviewer and is detrimental to the entire peer review process. Every comment that I made in my initial review was interpreted by the authors in the very worst possible light when in fact I meant almost none of what they inferred from my comments. While I had what I believe to be legitimate scientific concerns over the content of the paper, I bore no ill will toward the authors nor did I mean for any of my comments to be personally directed at them. In fact, I was so interested in the concept of the paper that I accepted the reviewer position despite numerous personal challenges I am facing as a result of the COVID-19 pandemic. The authors have shown quite clearly, however, that they are not willing to entertain constructive criticism of their work and that they are uninterested in engaging seriously in the peer review process. While I have completed a second review in the interest of fulfilling my obligation as a reviewer, I will no longer accept review requests for manuscripts written by these authors.

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Given the clarifications added in the revised version of the manuscript, I recommend publication in ACP but would appreciate the following comments being addressed:

The authors refer to the ANCISTRUS-derived circulation as the "Brewer Dobson Circulation" in several instances throughout the manuscript. It would be very helpful if the authors could provide an explanation of the relationship between the 2-D circulation described by ANCISTRUS and the 2-D residual circulation in the Transformed Eulerian Mean framework, which is often used interchangeably with the term "Brewer Dobson Circulation".

Lines 135-136: I still disagree that the upper left panels of Figures 1 and 2 necessarily represent a "realistic circulation field" and believe it would be more accurate to say that both information on transported structures and chemical sinks provide circulation-relevant information to the inversion system.

Lines 215-217: Typically, when people refer to the "branches" of the Brewer Dobson Circulation, they are referring to a "lower branch" at ~100-70 hPa and an "upper branch" at ~50-10 hPa. Here the authors are referring to a Northern Hemisphere branch and Southern Hemisphere branch, and the usage is confusing. Perhaps "cells" would be a better description than "branches".

Lines 337-338: The authors state that the main application of ANCISTRUS is to investigate the structure and possible changes of the Brewer Dobson Circulation, but it is more accurate to say that the method can investigate the structure and possible changes of the circulation as derived from ANCISTRUS until such time as a clear understanding of the relationship between the ANCISTRUS-derived circulation and either the diabatic circulation or the residual circulation is established.