

Dear Dr. Broccoli,

Thank you for your response to our submitted manuscript “What determines meridional heat transport in climate models?” Reviewers B and C have raised some thoughtful concerns that have lead towards a more precise, focused, and readable manuscript. We believe we have addressed ALL of their concerns in our revised manuscript and response to the Reviewers and hope you agree.

The primary concerns of Reviewer A are completely unsubstantiated and unfounded; the Reviewer’s primary concerns are based upon a bulk impression of our work as opposed to weighing the merits of our manuscript against the peer reviewed literature and we believe that his impression is both biased and unprofessional. The Reviewer states that the science questions in our manuscript “are poorly motivated and of ambiguous importance.” However, Lucarini and Ragone (2011) demonstrated -- and we reiterate in our manuscript -- that the inter-model spread in MHT_{MAX} is one order of magnitude larger than the anticipated change in MHT_{MAX} due to global warming. While the latter subject has received a great deal of interest in the literature, our manuscript is the first to analyze the cause of the inter-model spread in MHT_{MAX} . The scientific question analyzed in our manuscript is clear and precise; we analyze and successfully explain the cause of the inter-model spread in heat transport. This question has recently been posed in the literature, the signal is substantially larger than published work on similar subjects, and our work has implications for both global warming and paleoclimate.

At the request of the reviewer and yourself, we have thoroughly reviewed the literature, and with the exception of one missed citation (Trenberth and Fasullo, 2010, is certainly relevant to our manuscript and we apologize for not citing and discussing their results in our original manuscript) we feel the citations and literature discussion in the original manuscript covered the literature pertinent to our manuscript. We believe the Reviewers insistence that we have missed citations goes hand in hand with his failure to recognize the scientific merit of the question analyzed in our manuscript. The Reviewer’s failure to provide references to the “missing” citations is proof of this point; he can’t provide pertinent references because he hasn’t acknowledged the main points made in our manuscript. We believe the Reviewer is protecting his own interests and fishing for citations to his own work. We can not respond to his points because he hasn’t substantiated his points and his opinions are biased and unfounded.

We also believe that Reviewer #1’s assessment of our manuscript suffers from a confusion of what he understands about the climate system and what has been established in the literature. While the conclusions and insights of our manuscript may be intuitively obvious to the Reviewer, we believe these conclusions have not been previously found in the published literature. For example, while the Reviewer’s statements that “I find it obvious that...”, “It is widely recognized”, and questions of “Is this novel?” may indeed be true in the Reviewer’s understanding of the climate system, they have not been established in the published literature. Our manuscript answers a very pointed and straightforward question: what determines the inter-model spread of meridional heat transport between the tropics and extra-tropics? The Reviewer has challenged us to

explain what we have learned “that was not known previously”; we would like to counter this challenge by asking the reviewer where in the existing literature this question has been answered.

The reviewer also claims that our findings have little broader significance. We strongly disagree with this assessment. Our conclusions have broader implications that are at odds with the existing literature (i.e. Stone 1978, Enderton and Marshall 2009, Keihl 1994 and, Rose and Marshall, 2010) on some fundamental points. Please see our response to Reviewer A for a more specific discussion of these points.

In short, Reviewer A’s comments on our manuscript are biased, unsubstantiated and, fall well below the standard of the Journal of Climate’s peer review process. As such, we can not respond to the major revisions requested by the reviewer. We hope you agree with our assessment of this review.

Sincerely,

Aaron Donohoe
David Battisti