Contribution ID: **13** Type: **Poster**

Sensitivity of overturning circulation with changing isopycnal diffusivity

Tuesday 28 January 2020 17:05 (6 minutes)

The changes in the ocean circulation due to the changing isopycnal diffusivities K in a global non-eddy-resolving model configuration is investigated, which is implemented with PyOM in a horizontal resolution of $\sim 2^\circ \times 2^\circ$. Model setups with different values of constant K are used, while all other aspects of the model configuration are kept identical. Although the direct effect on density and thus the circulation is small by varying K, the model shows a surprisingly large sensitivity to the changes: with larger K, the oceanic interior tends to become cooler and fresher, resulting in a weakening of the deep water formation, and the strength of the overturning circulation weakens, as seen with the volume transport associated with the North Atlantic Ocean, Southern Ocean as well as the Antarctic Circumpolar Current. We find the following explanation: as the gradient of salinity is large on isopycnals; it leads to freshening in the deeper ocean and decrease in the horizontal gradient across the Antarctic Circumpolar Current. The results point out that the effect of forcing change on the on the ocean circulation could be as large as the effect of isopycnal diffusivity changes. Therefore, the choice of isopycnal diffusivity in the model can significantly impact the deep water formation and residual overturning circulation.

Do you need an official invitation letter?

Yes

Author: CHOUKSEY, Ashwita (Student)

Presenter: CHOUKSEY, Ashwita (Student)

Track Classification: COMMODORE conference