

Interactive comment on “Volume and temperature transports through the main Arctic Gateways: A comparative study between an ocean reanalysis and mooring-derived data” by Marianne Pietschnig et al.

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Received and published: 15 January 2018

Authors compared observation-based dataset (OBS) to largely independent reanalysis dataset. The heat budget of Arctic Ocean might be interannually varied. The authors showed the total heat budget of the Arctic Ocean based on the observation (153TW; OBS) in the period from September 2005 to August 2006. Is this value expected as normal one or significantly particular one? Can the authors infer and discuss based on the long-term mooring dataset (e.g., at the Fram Strait; Beszczynska-Möller et al., 2012)?

Although the total of heat budget of Arctic Ocean is worthwhile value, the “temperature transport” at a section is unphysical and meaningless value, when the mass budget is not zero at the section. For example, if the reference temperature is set to freezing point of seawater (~ -1.8 degree), the estimated heat flux means the contribution to sea-ice melting. If the reference temperature is set to averaged temperature in the Arctic Ocean, the calculated value indicates the contribution to warming/cooling of Arctic Ocean. To directly compare the temperature is better for validation of OBS or reanalysis dataset. What does seem sure is that the “temperature transport” defined in this paper should not be used.

Interactive comment on Ocean Sci. Discuss., <https://doi.org/10.5194/os-2017-98>, 2017.

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