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Biogeosciences
Discussions

Interactive comment on "Using ^{226}Ra and ^{228}Ra isotopes to distinguish water mass distribution in the Canadian Arctic Archipelago" *by* Chantal Mears et al.

Michael E. Böttcher (Referee)

michael.boettcher@io-warnemuende.de

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The submitted manuscript on "Using 226Ra and 228Ra isotopes to distinguish water mass distribution in the Canadian Arctic Archipelago" by Mears, Thomas, Henderson, Charette, MacIntyre, Dehairs, Monnin, and Mucci, presents a detailed data set for a hydrographic and chemical characterization of water masses in the Canadian Arctic Archipelago that was derived during the GEOTRACE program: Oxygen isotopes (18O/16O) of water, radium isotopes, parameters of the dissolved carbonate system (AT, DIC), and dissolved Ba. The data are used to separate water masses and mixing properties, and define Ra sources. A thermodynamic analysis is used to defined

the saturation states of the aqueous solution wrt. barite, and all data are furthermore analyzed by a principle component analysis (PCA).

I will not repeat the arguments already provided in the detailed review by Michiel Rutgers van de Loeff, which I agree upon, and only concentrate on further minor aspects.

Overall, the data data set is original, impressive, and the conclusions derived from the investigation are well argued, including the presenting figures.

Detailed comments:

- I suggest to add a covariation diagram and further discussion of d18O-H2O values versus salinity.

- Fig.2: Its: d18O.

- Table 2: Units are missing.

- Reference list:

-L624: What kind of publication is this?

-e.g., lines 618, 631, 664, 710, 728 etc.: Please delete all informations about 'access dates' and if an article was read on-line from the reference list. Serious scientific journals guarantee that the scientific content published after acceptance is the same off- and on-line, and keeps its content in all details over time. This may be different for other on-line sources, that are often questionable permanent references.

Michael Ernst Böttcher, April 17th, 2020

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