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The Cryosphere Discussions

Interactive comment on "Multi-model based estimation of sea ice volume variations in the Baffin Bay" *by* Chao Min et al.

Anonymous Referee #2

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The sea ice volume variations within the Baffin Bay is investigated using mode-based sea ice thickness and NSIDC sea ice drift product. Since field measurements of sea ice thickness is scarce, this study presents the best way to estimate the sea ice inflow/outflow of the bay. Moreover, the volume amounts in associated with freezing and melting processes are also quantified. Generally, this is a good attempt to conduct the studies related to sea ice volume, which is a better indicator, in relative to area, to interpret the current rapid climate changes. Before the publication of this study, minor revisions are needed as follows: L77, "...in Fram Strait and obtained" to "..in Fram Strait to obtain..' L79 "2.2..." L88 "2.3" L101 "..the years..." to " the short period" L110 " ...full filled..." to "... fully filled' L114 "date" to "data" L 140 " are a typical representation" to " typically represent" L 166 the sentence for " A fairly. ...ice drift". Make it to

two short sentence in order to clarify your description. L181 "Originate" to "Originates" L 186- 189, this sentence is too long to follow the content. I recommend the authors to make it short or by dividing it to two sentences. L197, remove ",respectively" L199 "In average" to "On average" L210 "invested" to "investigated"? L214, "in average" to "on average" L224 "found" to "identified" L226 what "these areas" represents for? Please clarify. L240 "with of the usage" to "with the usage"

Does the author have considered the impacts of large-scale atmospheric circulation, such as NAO, on the variations of sea ice volume in Baffin Bay? The NAO may be associated with the inflow/outflow, as well as the freezing and melting processes. Therefore, through the analysis of the correlation between NAO and sea ice volume changes owing to these processes may give us a preliminary understanding of the role of the large-scale atmospheric circulation in modulating the Baffin Bay sea ice volume variations.

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