

# ***Interactive comment on “Medium-range predictability of early summer sea ice thickness distribution in the East Siberian Sea: Importance of dynamical and thermodynamic melting processes” by Takuya Nakanowatari et al.***

**Anonymous Referee #2**

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General comments:

This paper evaluates (1) sea ice thickness (SIT) from the 4th version of the Towards an Operational Prediction system for the North Atlantic European coastal Zones (TOPAZ4) ocean data assimilation system and (2) medium range forecast of SIT distribution in the Eastern Siberian Sea (ESS) from the TOPAZ ocean data assimilation system forced by the ECMWF atmospheric medium-range forecast data. The evaluation of TOPAZ4 SIT uses observational data from satellite retrievals, in situ observations and model generated output from the Pan-Arctic Ice Ocean Modeling and Assimilation System

(PIOMAS). The forecast evaluation analyzes impacts of dynamic and thermodynamic processes. Descriptions of the methods and analysis are clear. The results are interesting. I recommend the paper be accepted for publication after a minor revision.

#### Specific comments

1. The SIT from the TOPAZ4 assimilation contains large errors which are comparable to that in PIOMAS. I would suggest that the both TOPAZ4 SIT and PIOMAS SIT be used for the evaluation of the forecast to reduce the observational uncertainties. I also suggest PIOMAS be included in Figure 1.
2. A large portion of the PCC skill in Figure 5 is from the persistence. A comparison with persistence skill is needed to see to what extent the sill in Figure 5 has benefited from the persistence of the initial anomalies.
3. Lines 134-138. Move the portion "In this . . .process [Startk et al. 2008]" into the first paragraph of section 2.
4. Line 145. How is the 10-member ensemble produced?
5. Line 146. Spell out ECMWF.
6. Line 149. Please make clear how the 259 cases come out.
7. Line 172. Spell out PIOMAS.
8. Line 272. Change "completely" to "largely". The correlation shows that they are still related to some extent.
9. Line 371. Fig.14a does not exist.
10. "Figure" and "Fig." are used interchangeably.

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