

Interactive comment on “Seasonal changes in sea ice kinematics and deformation in the Pacific Sector of the Arctic Ocean in 2018/19” by Ruibo Lei et al.

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Reply to reviewer 2

1 Tide is an important contributor to sea ice deformation. Thus, the discussion about the effects of tide is of interest to improve the understanding of this study. –Yes, tide is an important contributor to sea ice deformation, especially over the shallow waters. However, using the buoys data, it is hard to identify the effect of tide forcing on ice deformation. Firstly, we will add some qualitative discussions on the effect of tide forcing on ice deformation, which is relatively weak in the deep basin, where the buoy array were deployed; secondly, we will add some spectrum analysis to identify the

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influence of tide forcing on the quasi semidiurnal oscillation of ice motion.

2 The results of this study are insightful. However, to make the results more robust, some comparisons between results of this study and those of other regions or satellite observations are encouraging. –Thanks for the suggestions. To enhance the representativeness of our results and give some basin-scale implications for the ice dynamics, we will add some comparisons with results obtained from other regions or the close region in other years, as well as that obtained from the estimations based on satellite observations.

3 Arctic sea ice decline is in a faster track and the ecological impacts are more apparent. Therefore, it would be useful to discuss the association between sea ice deformation and Arctic sea ice decreases and related ecological process. –We will add some discussions on the implications of enhanced ice deformation on Arctic ice loss and some ice-associated ecological processes.

4 L29, “western parts” -> “eastern parts”? L97 “for example” -> “, for example,” L116 “From” -> “of” –We will correct these linguistic errors, and check the language through the manuscript again.

5 L37, “enhanced Arctic Dipole (Lei et al., 2016)-> some other references may be relevant, such as: Bi, H., Yang, Q., Liang, X., Zhang, L., Wang, Y., Liang, Y., and Huang, H., 2019, Contributions of advection and melting processes to the decline in sea ice in the Pacific sector of the Arctic Ocean. *The Cryosphere*, 13, 1423-1439. Ding, Q., et al., 2017, Influence of high-latitude atmospheric circulation changes on summertime Arctic sea ice. *Nature Climate Change*, 7, 289-295. –We will cite these two references and enhance the discussions on the influence of atmospheric circulation on ice motion.

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