

Interactive comment on “Understanding the Mechanism of Arctic Amplification and Sea Ice Loss” by Kwang-Yul Kim et al.

Anonymous Referee #2

Received and published: 15 May 2017

The paper applies a sort of regression analysis to the wintertime (JF) sea ice loss in the Barents-Kara seas. The review of prior literature on Arctic amplification and sea ice loss is often confusing, including in the definition of key concepts such as Arctic amplification or albedo feedback. Based on the explanations given in the manuscript, I cannot understand the authors' methodology sufficiently to judge its value. The manuscript lacks a critical appreciation of the method, e.g. a discussion of how much of the time-series and trend is actually captured by the first 'mode' obtained in the analysis. My fundamental concern with the manuscript is that it uses correlations to establish causalities and feedbacks, with little regard to the physical and meteorological phenomena discussed. As an example, the feedback loop suggested as a key result of the paper begins with sea ice reduction which supposedly causes warming of 850 hPa temperatures. The alternative explanation that warm air advection contributes to sea ice loss is

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at least as plausible, but not even mentioned in the manuscript. I further do not see any justification for fitting an exponential to the time series of sea ice loss in the Barents-Kara seas, and far less for using that fit to make a prediction on when this ocean area would remain ice-free in winter.

In conclusion, I regret to say that the manuscript fails to meet basic scientific standards.

Interactive comment on The Cryosphere Discuss., doi:10.5194/tc-2017-39, 2017.

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