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Realism of simulated internal variability in Arctic sea ice

Christopher Wyburn-Powell¹, Alexandra Jahn¹, and Mark England^{2,3}

¹Atmospheric and Oceanic Science Department and Institute of Arctic and Alpine Research, University of Colorado at Boulder, Boulder, USA

²Scripps Institution of Oceanography, UCSD, La Jolla, USA

³Department of Physics and Physical Oceanography, University of North Carolina at Wilmington, Wilmington, USA

Arctic summer sea ice has decreased dramatically over the last few decades, particularly in the summer months. The observed decline is faster than most CMIP5 models, but if internal variability is considered, models and observations are not inconsistent. With only one realization of reality in observations, it is difficult to disentangle the role of internal variability from the forced response. We directly compare one metric of internal variability by resampling both observations and models. So far we have compared five CMIP5 models from the CLIVAR multi-model large ensemble archive (CanESM2, CESM1, CSIRO MK36, GFDL ESM2M, and MPI ESM1). For the pan-Arctic, these models were found to have higher internal variability than observed by approximately 10-50% across models and seasons. Spatially, we find the variability in ice edge region is consistently modelled well in March. In September, although the member mean of the models shows both smaller absolute declines and smaller variation of such declines with resampling, the models have at least one member consistent with observations. This allows us to conclude that the models' representation of this specific metric of internal variability is consistent with observations.