B07-P04

THE SEA ICE ALBEDO FEEDBACK IN ACTION: A CASE STUDY

Alex West *(Met Office , United Kingdom)*
Jeff Ridley *(Met Office, United Kingdom)*

alex.west@metoffice.gov.uk

In this study, the importance of late spring sunlight in maintaining an accurate sea ice state in conjunction with the sea ice albedo feedback is demonstrated. We examine surface and atmosphere radiative fluxes from 1980-1999 over the Arctic Ocean in the coupled model HadGEM2-ES, which simulates thinner sea ice than is suggested by observations for this period. Thinner modelled sea ice in its initial state can result in an earlier ice-free Arctic under global warming. Modelled radiative fluxes are compared to observational sources including the ISCCP-FD dataset and the ERA40 reanalysis.

It is found that pronounced positive anomalies in net downward short-wave radiation (SW) develop in HadGEM2-ES in May and June. In May the model displays excess downwelling SW, but in June a lower albedo results in an excess surface absorption. Spatial anomalies of net SW and ice concentration (relative to the HadISST1.2 dataset) are examined. Negative ice concentration anomalies develop in June, intensifying over the summer, in similar regions to the strongest earlier net SW anomalies. It is posited that the initial May downwelling SW anomalies act to precipitate anomalous summer melt via the ice albedo feedback, thus explaining the overly thin sea ice in HadGEM2-ES.