



The Structure and Evolution of Extratropical Cyclones in a High Resolution Coupled Climate Model

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HiGEM is a new high resolution coupled climate model based on the Met Office Hadley Centre's HadGEM1 and with a horizontal atmospheric resolution of 0.83° latitude $\times 1.25^\circ$ longitude. The horizontal and vertical structure of the 50 most extreme extratropical storms in the Atlantic and Pacific in HiGEM are investigated using a novel tracking and compositing methodology. The results from HiGEM are compared with the lower resolution model, HadGEM and the ECMWF reanalysis data. Using this automated method detailed structures of wind speeds, mean sea level pressure, temperature and vertical velocity can be analysed. It is found that HiGEM represents certain features of the structure of the most extreme storms well. In particular the location of the maximum wind speeds relative to the composite storms match closely between HiGEM and ERA-40. When comparing with the lower resolution model, it can be seen that the increase in resolution from HadGEM to HiGEM improves the representation of the most extreme storms studied especially in terms of wind speeds and vertical velocities.