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Differences in Detection and Attribution Analysis Using High-Top vs. Low-Top Models

D. Mitchell (1), L. Gray (1), P. Stott (2), and M. Allen (1)
(1) Oxford University, United Kingdom (mitchell@atm.ox.ac.uk), (2) Met Office, United Kingdom

Detection and attribution methods are commonly used to identify a change in the climate state. Here we compare temperature changes in the free atmosphere for different latitude bands using a low-top version of the Met Office Hadley Centre earth system model compared with a high-top version. In addition to the standard historical (1960-2010) simulations which include all known forcings, runs with natural only forcings and greenhouse gas only forcings have also be performed. The low and high top models are identical except for their relative lid heights of 10hPa and 0.1hPa respectively. References to other high-top/low-top models from CMIP5 are also made. Comparisons are drawn using trend analysis and optimal fingerprinting techniques to reveal differences between the two model types.