



East Asia monsoon fronts and associated precipitation: Impact of horizontal model resolution in the UK Met Office Unified Model

Amulya Chevuturi (1,2), Nicholas P. Klingaman (1,2), Andrew G. Turner (1,2), Kevin I. Hodges (1,2), Reinhard Schiemann (1,2), Liang Guo (1,2), Julia Curio (1,2)

(1) National Centre for Atmospheric Science, University of Reading, Reading, United Kingdom, (2) Department of Meteorology, University of Reading, Reading, United Kingdom

The East Asian monsoon is associated with unique “rainy seasons” which are frequently referred to as “Meiyu” in China, “Baiyu” in Japan and “Changma” in Korea. These rainy seasons coincide with the passage of frontal systems over these regions during May-July, leading to synoptic-scale variability during the East Asian monsoon season. These East Asian monsoon fronts (EAMF) are characterised by strong moisture gradients in the low-level jet and extend zonally across East Asia. A recent study established an objective algorithm for detecting the presence and location of EAMF, based on meridional gradients in low-level equivalent potential temperature. Building upon this dynamical index, we aim to examine the intra-seasonal and inter-annual variability of the EAMF location and associated precipitation in the UK Met Office Unified Model (MetUM) against the reanalysis. We evaluate the MetUM Global Atmosphere 7.1 climate simulations at three different horizontal resolutions (N96, N216 and N512) for the period of 1979-2014 (May-June-July) to study the effect of horizontal resolution on EAMF. The MetUM represents well the position of EAMF and the large-scale teleconnections influencing these. But our results highlight possible model deficiencies in underestimating the frequency of EAMF while overestimating associated precipitation.