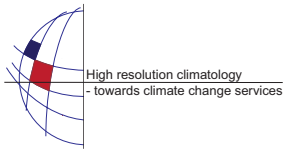
EMS Annual Meeting Abstracts
Vol. 7, EMS2010-349, 2010
10th EMS / 8th ECAC



Analysis of MJO forecast errors in a seamless system

P. Xavier and A. Shelly
Met Office Hadley Centre, Exeter, UK

The Madden–Julian oscillation (MJO) is the dominant component of intraseasonal variability in the tropics. In recent years, the role of MJO in the global climate system has been well recognized due to its interactions with other components of the climate system. Forecasting MJO at medium-range provides a seamless link between short-range weather prediction (NWP) and seasonal-to-interannual climate variations. The Met Office Unified Model (MetUM) suite of operational forecast tools provides a means to assess and forecast the MJO in a seamless environment. This study compares the MJO representation and its forecast skills between 1-15 days in two MetUM operational forecast systems namely i) the Met Office Global and Regional Ensemble Prediction System (MOGREPS) and ii) the new Met Office Seasonal forecasting system (GloSea4). MJO CLIVAR suite of diagnostics is applied on both forecasts from a number of identical initial conditions (taken from the Met Office operational analysis) to extract the MJO signals in terms of real-time multivariate MJO indices (RMMs).

In both systems the convective perturbations propagate well across the Indian Ocean but unlike in the observations, there is much weaker propagation east of the dateline. Both systems show significant MJO forecast skills in the medium range. The forecast error develops earlier in the GloSea4 system than the MOGREPS, which could be associated with the mean sea surface temperature (SST) biases in the Indian Ocean and a potentially faster error growth in the GloSea4 coupled system. A detailed analysis on the growth of initial MJO errors and its link with the seasonal forecast biases will be presented.