



Interannual variability and predictability of African Easterly waves in the CNRM GCM

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The interannual variability of African Easterly Waves (AEW) is assessed with the help of Spatio-Temporal Spectral Analysis (STSA) and Complex Empirical Orthogonal Functions (CEOF) methods applied to the results of 10-member multi-year ensemble simulations. Two sets of experiments were conducted with the Météo-France ARPEGE-Climat GCM, one with interactive soil moisture (control), and the other with soil moisture relaxed towards climatological monthly means calculated from the control. Composites of Soudano-Sahelian AEWs were constructed and associated physical processes and dynamics were studied in the frame of the waves.

It is shown that the model is able to simulate realistically some interannual variability in the AEWs, and that this dynamical aspect of the West African climate is potentially predictable (i.e. signal can be extracted from boundary conditions relatively to internal error of the GCM), especially along the moist Guinean coast. Compared with ECMWF 15-year reanalysis (ERA15), the maximum activity of AEWs is located too far to the South and is somewhat too zonal, but the main characteristics of the waves are well represented. The major impact of soil moisture relaxation in the GCM experiments is to reduce the seasonal potential predictability of AEWs over land by enhancing their internal variability.