A modeling study to investigate the recent trends in the climate of West Africa Sahel Abdoulaye Sarr[†];

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This study investigates the new trends in the climate of West Africa with an emphasis on the Sahel region. The regional climate model RegCM, developed by the International Center for Theoretical Physics (ICTP), is used to perform high resolution simulations (40km) over a region covering West Africa from 1999 to 2009. Inter annual and seasonal variation studies of the monsoon, a key component of West Africa climate system characterized by many scale interactions is carried out. These simulations are assessed against divers datasets using selected key parameters. Various techniques, using indices, are performed to understand the local dynamic and thermodynamic associated with the new trend noticed in the climate of the region of interest know as Sahel, when compared to the drought period. The same investigation is also done using NCEP version 2 reanalysis when comparing the dry period and the new trends observed. A dynamical normalized seasonality index of West Africa Monsoon and other indices, based on known features like the heat low, the African Easterly Jet are used. For consistency investigation, mean vertical structure of moist static energy is also computed in this study. A focus is done over Sahel by analyzing the interannual variability in order to better understand the see-saw behavior which characterized the first part of the period and a slightly sustained recovery, on average, since 2005. While other seasons are investigated, special attention is paid to the rainy season critical for major development sectors like agriculture, pastoralism, water resources etc.