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Statistical prediction model for West African rainfall. Terms of stationarity of the predictors.

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An statistical seasonal prediction model has been developed based on Maximum Covariance Analysis (MCA), in order to evaluate and quantify the forecast depending on the stationarity in the relationship between a predictor and a predictand. The model has been applied to the study of predictability of the West African Monsoon (WAM) rainfall variabiliy from the main mode of co-variability derived from MCA. Some preliminary results, considering the sea surface temperature (SST) of Atlantic, Pacific and Indian ocean basins as predictors, show an improvement in the skill of the model when using these predictors with non-stationary character.

Throughout the study period, significant influence intervals that determine the non-stationary character of the predictors, have been established through the use of moving windows correlation. This method is applied for different time lags in the SST field in order to give the model a predictive character. In this way, the model refers to the non-stationary case when the period taken for the predictor consider the sequence of years with significant correlations with rainfall, while the stationary case takes into account the whole period. Thus, the modes obtained with MCA for the hindcast performed for the stationary case and the non-stationary one are compared in order to elucidate the causes for this absence of stationarity in the predictability.