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Short-lead predictability of intraseasonal oscillations of the convective activity in West Africa

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Among the different time scales of the West African Monsoon (WAM) variability, the intraseasonal time scale is one of the greatest issue of importance for agricultural strategy as the occurrence of dry spells can strongly impact yields of rainfed crops. This study investigates the intraseasonal variability of convection over West Africa and gives a first overview of its predictability at a short lead-time. A statistical method, the Singular Spectrum Analysis (SSA), is applied to convection indexes for the northern summer from 1979 to 2000 in West Africa to describe first temporal patterns of the main leading modes of intraseasonal variability. This analysis is performed independently using daily OLR data, observed rainfall and rainfall from reanalyses datasets (both NCEP/DOE and ERA40). The results point out the existence of an oscillatory mode of 34 days and two oscillatory modes of 20 and 14 days. The characteristics of these three modes are very close from one dataset to another. The short-lead predictability (5 to 10 days) of these modes is investigated by using both the Maximum Entropy Method (MEM) and the ECMWF operational prediction scheme. For the two methods, we use unfiltered input data to match an operational objective. The forecast skill appears to be very low for the whole 10-90-day intraseasonal band but the predictability of individual intraseasonal modes of 34, 20 and 14 days is higher. The MEM method gives the highest and the most stable skills. The stability of the forecast skills is influenced by the characteristics of the intraseasonal mode. When the characteristics (amplitude and period) of the considered intraseasonal mode are well-defined, high-quality forecasts can be obtained. However, when the mode is not-well defined (when characteristics, e.g. amplitude and period, change rapidly), the forecast fails.