Session: B5 Oral presentation

The role of synoptic scale dry-air intrusions on the West African monsoon onset using regional modeling and nudged climate simulations. Application to the monsoon onset of 2006

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These results complement the ones presented in Mohino et al. in the same session (Impact of the Indian part of the summer MJO on West Africa using nudged climate simulations) by focusing on the particular case of the West African monsoon (WAM) onset period. The transitional phase of the WAM onset is generally characterized by a 20-day period of weakened convection. Over the period 1989-2008, both observational datasets and LMDZ Asian-nudged simulations show that a teleconnection mechanism induced by the Indian monsoon onset has a significant impact on the WAM onset. The initiation of convective activity over the Indian subcontinent north of 15^{o}N at that time results in a westward propagating Rossby wave establishing over North Africa 7-15 days after. A back-trajectory analysis shows that this wave pattern induces dry air intrusion originating from the westerly subtropical jet entrance which subsides and moves southward over West Africa inhibiting convection there. At the same time the low-level pressure field over West Africa reinforces the moisture transport inland. After the passage of the wave, the dry air intrusions weaken drastically. Hence 20 days after the Indian monsoon onset, convection is released over the Sahel where thermodynamic conditions are then more favorable. The WAM onset of 2006 is examined in this context by performing sensitivity tests with WRF model.