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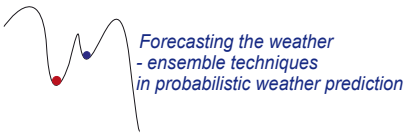

Are NWP models able to represent the diurnal cycle in West Africa?

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The diurnal cycle is a fundamental mode of variability in the Tropics. Nevertheless, NWP and climate models have difficulties in representing this mode of variability. Extensive observations were collected during the AMMA (African Monsoon Multidisciplinary Analysis) field campaign with in particular two periods with radiosoundings launched every three hours and numerous surface measurements. This enables to characterize the diurnal cycle of the low levels and the energetic budget at the surface. In this study, we evaluate the capacity of two NWP (ECMWF and ARPEGE models) to represent the main characteristics of four different regimes stratified in terms of temperature from a moist and cold regime to a dry and warm regime.
In addition to the observations, a special AMMA re-analysis was carried out at the ECMWF and provides information on larger scale circulations. It was used in a simple framework proposed here in order to evaluate the capacity of models in 1D-version. and therefore allows sensitivity tests to different parametrizations and configurations. In particular, the analysis of the interaction of the surface with atmosphere and its role in shaping the diurnal cycle of the low levels will be discussed.