Seasonal predictability of the Atlantic Meridional Mode and its link with the Guinea Dome

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Seasonal predictability of the Atlantic Meridional Mode is investigated by use of the SINTEX-F climate model from the viewpoint of the preconditioning role of the Guinea Dome. The 2009 strong negative event is successfully predicted a few months ahead when the model is initialized using a three-dimensional variational ocean data assimilation (3DVAR) method. However, nudging the sea surface temperature (SST) only for the initialization fails to predict the event. It is shown that the mixed-layer depth in the Guinea Dome region is unrealistically deep in the latter. Denying even one ocean mooring array data at 12ºN, 23ºW in the 3DVAR initialization clearly demonstrates that monitoring the Guinea Dome is very important for predicting the Atlantic Meridional Mode.

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