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A Gill-Matsuno-type mechanism explains the Tropical Atlantic influence on African and Indian Monsoon Rainfall

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Recent studies using coupled atmosphere-ocean models have shown that the tropical Atlantic has a significant impact on the Indian monsoon. In this paper, the observational basis for this teleconnection is examined and the physical mechanism responsible for bridging sea surface temperatures (SSTs) in the Atlantic and precipitation over India is investigated with idealized atmospheric general circulation model (AGCM) experiments in which constant SST anomalies are prescribed and świtched-onín the tropical Atlantic region. A simple Gill-Matsuno-type quadrupole response is proposed to explain the teleconnection between the tropical Atlantic and the Indian basin, with an enforcement of the eastward response likely due to nonlinear interactions with the mean monsoon circulation. The simplicity of this mechanism suggests reproducibility of this result with a broad range of AGCMs.