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Improved hindcasts of Indian monsoon rainfall using a Tier 1.5 approach

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In this work it is shown that using what may be called 1.5-tier approach leads to considerably improved Indian Summer Monsoon rainfalls (IMR) hindcasts as compared to the original coupled model hindcasts from the DEMETER project. The expression 1.5-tier indicates that the DEMETER sea surface temperature (SST) anomalies are used everywhere outside the Indian Ocean region to force an Atmospheric General Circulation Model (AGCM), whereas inside the Indian Ocean, either a fully coupled OAGCM or a simple mixed-layer ocean is used to simulate the effect of air-sea coupling. Further experiments are devised to perform a comparison with a pure 2-tier approach, where DEMETER SST anomalies are prescribed everywhere.