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Seasonal Climate forecasts with the FSU Multimodel Superensemble including a downscaling component for the Japan region

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The FSU multimodel superensemble carries a suite of 16 global coupled models. Our study of monthly to seasonal forecasts of precipitation covers 15 years of forecasts. There are some new features that are presently being included in our modeling. A special monsoon raingauge based precipitation data base, prepared by Research Institute for Humanity and Nature and Meteorological Research Institute/Japan Meteorological Agency Those estimates of daily rains over land areas are complemented by the so called TRMM 3B42 rains over the oceans and data sparse tropics. This merged daily data base provides precipitation estimates at a horizontal resolution of 0.5 degrees latitude/longitude covering several decades. A first component of modeling is to use the forecasts of the 18 models and to prepare ensemble forecasts at a large scale resolution of 100km. The next step in our exercise includes downscaled precipitation forecasts for each of the member model's forecasts, following our recent papers. This is followed up with the construction of monthly and seasonal forecasts of precipitation over a greater Asian Monsoon belt using the downscaled superensemble. We include both deterministic and probabilistic measures of skill score estimations for our forecasts. The downscaling, training and forecast validations make use of the high resolution observed estimates of rains from TRMM. Our results show that we can improve the results of seasonal forecasts from these tools much above those that are possible from just the model results of the large scale models.

Keywords: multimodel superensemble, Seasonal Climate forecasts, raingauge observation, TRMM, downscaling, Asian Monsoon