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Use of satellite-derived water budget data to assess water vapor transports from reanalysis data

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The divergent component of water vapor transports was constructed using evaporation, precipitation, and total precipitable water estimated from the Special Sensor Microwave Imager (SSM/I). The SSM/I moisture budget parameters are then compared with those from the National Centers for Environmental Prediction (NCEP), the European Centre for Medium-Range Weather Forecasts (ECMWF) 40-year Reanalysis (ERA40), and Japanese 25-year Reanalysis Project (JRA25) data over the Asian monsoon region for the May to September (MJJAS) period from 1988 to 2000.

From the comparison of water budget parameters of NCEP, ERA40, and JRA25 reanalysis with SSM/I-derived features, we found that the general features of all three reanalyses are in good agreement with those from SSM/I; however, the magnitudes of water vapor transports are considerably weaker in all three reanalyses. In addition, much weaker water vapor transports in three reanalyses are found in the intraseasonal oscillation signals although the oscillation patterns are quite similar to what inferred from the SSM/I measurements.