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Mean Features of Tropical Cyclone Precipitation from TRMM/3B42

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The mean features of precipitation distribution associated with tropical cyclones are evaluated as anomalies from environmental precipitation fields, in six tropical cyclone active basins (the western North Pacific, the eastern North Pacific, the north Atlantic, the north Indian Ocean, the south Indian Ocean, and the South Pacific), using satellite-derived daily precipitation observation. A common feature in all basins is that concentric positive precipitation anomalies extend within a 5-degree radius from the tropical cyclone center with maximum values of 70 to 100 mm/day. These distributions are well approximated by a Gaussian curve with an e-folding radius of 2.2 to 2.8 degrees. Positive precipitation anomalies are surrounded by negative anomalies in all basins, indicating suppression of precipitation due to the tropical cyclones themselves at a large distance from the center. The negative anomalies have minimum values of -2 to -3 mm/day and are distributed mainly on the equatorial side of the center. Precipitation excess frequency around the tropical cyclones is also evaluated. The western North Pacific has maximum values of excess frequencies in all basins, in which the frequency for 100 mm/day is 26 days/yr and that for 200 mm/day is 1.8 days/yr within a 1-degree radius from the center. We assume that tropical cyclones in the western North Pacific have the greatest precipitation intensity.

Keywords: Tropical Cyclone, Precipitation