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Driftsonde applications in tropical north-western Pacific typhoon seasons

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The western Pacific is the most active basin for tropical cyclone activities. However, the rawinsonde distribution in this region is quite sparse. For example, there is no rawinsonde station in between Guam and the islands along the western Pacific rim. Without the US reconnaissance support in that region since late 1980s, satellite became the only viable data source to fill in the big data gap among rawinsonde stations for typhoon activities. The lack of observations poses a major problem in diagnosing and forecasting typhoon activities in that region, especially on the performance of numerical models.

It has been shown that assimilating dropsonde data released by the NOAA-GIV surrounding Atlantic hurricanes has positive impact on hurricane track model forecasts. In fact, releasing dropsondes from an aircraft has limitations on the spatial and temporal coverage plus incurring relatively high cost in operating the aircraft. A novel idea of releasing dropsondes from a series of high flying balloons will be executed/explored during the 2006 AMMA field experiment in Africa. This idea expects to provide an extensive spatial dropsonde coverage over the Atlantic tropical cyclone corridor at a lower cost.

The purpose of this paper is to examine the feasibility of applying this novel idea to the western Pacific region during the typhoon season. We will use historical data (NCEP/NCAR reanalysis) to simulate the temporal and spatial distributions of these driftsonds launched from the islands in the central Pacific in several historical typhoon events. A strategy on how/where/when to launch driftsondes that can achieve the optimal temporal and spatial coverage during a typhoon event will be presented.