Results of the NASA Kennedy Space Center 50-MHz Doppler Radar Wind Profiler Operational Acceptance Test

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This paper presents results of the new Kennedy Space Center (KSC) 50-MHz Doppler Radar Wind Profiler (DRWP) Operational Acceptance Test (OAT). The goal of the OAT was to verify the data quality of the new DRWP against the performance of the previous DRWP in order to use wind data derived by the new DRWP for space launch vehicle operations support at the Eastern Range. The previous DRWP was used as a situational awareness asset for mission operations to identify rapid changes in the wind environment that weather balloons cannot depict. The Marshall Space Flight Center's Natural Environments Branch assessed data from the new DRWP collected during Jan-Feb 2015 against a specified set of test criteria. Data examination verified that the DRWP provides complete profiles every five minutes from 1.8-19.5 km in vertical increments of 150 m. Analysis of 49 concurrent DRWP and balloon profiles presented root mean square wind component differences around 2.0 m/s. Evaluation of the DRWP's coherence between five-minute wind pairs found the effective vertical resolution to be Nyquist-limited at 300 m for both wind components. In addition, the sensitivity to rejecting data that do not have adequate signal was quantified. This paper documents the data, quality control procedures, methodology, and results of each analysis.