A high-resolution merged wind dataset for DYNAMO: Progress and future plans

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In order to support research on optimal data assimilation methods for the Cyclone Global Navigation Satellite System (CYGNSS), launching in 2016, work has been ongoing to produce a high-resolution merged wind dataset for the Dynamics of the Madden Julian Oscillation (DYNAMO) field campaign, which took place during late 2011/early 2012. The winds are produced by assimilating DYNAMO observations into the Weather Research and Forecasting (WRF) three-dimensional variational (3DVAR) system. Data sources from the DYNAMO campaign include the upper-air sounding network, radial velocities from the radar network, vector winds from the Advanced Scatterometer (ASCAT) and Oceansat-2 Scatterometer (OSCAT) satellite instruments, the NOAA High Resolution Doppler Lidar (HRDL), and several others. In order the prep them for 3DVAR, significant additional quality control work is being done for the currently available TOGA and SMART-R radar datasets, including automatically dealiasing radial velocities and correcting for intermittent TOGA antenna azimuth angle errors. The assimilated winds are being made available as model output fields from WRF on two separate grids with different horizontal resolutions - a 3-km grid focusing on the main DYNAMO quadrilateral (i.e., Gan Island, the *R/V Revelle*, the *R/V Mirai*, and Diego Garcia), and a 1-km grid focusing on the *Revelle*. The wind dataset is focused on three separate ~2-week periods during the Madden Julian Oscillation (MJO) onsets that occurred in October, November, and December 2011. Work is ongoing to convert the 10-m surface winds from these model fields to simulated CYGNSS observations using the CYGNSS End-To-End Simulator (E2ES), and these simulated satellite observations are being compared to radar observations of DYNAMO precipitation systems to document the anticipated ability of CYGNSS to provide information on the relationships between surface winds and oceanic precipitation at the mesoscale level. This research will improve our understanding of the future utility of CYGNSS for documenting key MJO processes.