Shipborne Marine X-band Radar Wave Retrieval During ITOP: Comparison With WAVEWATCH-III

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During the *Impact of Typhoons on the Ocean in the Pacific* (ITOP) program in 2010, a marine X-band radar was installed on *R/V Roger Revelle* to estimate surface waves, currents, and winds. This study focuses on radar-retrieved waves, in particular their spatio-temporal variability in extreme weather. Marine radars are capable of sampling backscatter images at high frequency (> 40 rpm), offering the unique opportunity to monitor multi-modal and quickly changing seas. Here, we analyze data that were collected in proximity of 4 tropical cyclones: Dianmu, Fanapi, Megi, and Chaba. The radar wave estimates are compared with results from an ocean wave hindcast using a nested model that is based on WAVEWATCH-III, with the inner nest centered on the northwestern Pacific. Directional wave spectra were output at 30-min intervals along the ship's trajectory. The comparison shows good agreement between radar measurements and model, in particular regarding the sea's multi-modal characteristics.