
Analysis of Propagation of Typhoon Waves Based on CFOSAT Observation

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Résumé

The real-time and large-scale monitoring wind and wave fields are of great significance for navigation and human activities on the sea, especially under severe typhoon processes when hazardous waves occur. The SCAT with swath width of about 1000 km and SWIM with swath width of about 180 km onboard the CFOSAT provide us unprecedented, simultaneous and co-located observation of wind and waves in globe ocean. Based on the CFOSAT SWIM and SCAT observations, we analysis wave characteristics under some typhoon processes in the Northwestern Pacific. One result shows that the significant wave heights (SWHs) are over 5 m on the right side of the typhoon track for wind speeds over 14 m s⁻¹, agreeing with the theoretical estimates. The dominant waves have wavelengths of 150 – 180 m, and propagate eastward for northwestward blowing winds. The misalignment of the wind and wave directions increase with the distance from the typhoon center, agreeing with theoretical prediction. Using wave spectrum conception, propagation characteristic of swell is presented in another case study. The result show that 500 kilometers away from the center of the typhoon, the wave speed is 58 km/h, with wavelength about 120 m and wave heights about 2 m, and local wind speed about 7 m/s.

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