
Up-to-downwave asymmetry of CFOSAT SWIM fluctuation spectrum for the direction ambiguity removal

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Résumé

The surface waves investigation and monitoring (SWIM) aboard China-France oceanography satellite (CFOSAT), a pioneer conically scanning wave spectrometer is successfully launched on October 29, 2018. Its configuration of one nadir and 5 off-nadir incidence angles is dedicated to simultaneous observation of both significant wave height and directional wave spectrum at the global scale. In this study, we take advantage of the clockwise rotation of the three spectral beams (incidence angle = 6,8,10 degree) across the whole azimuth angles to examine properties of the two-dimensional fluctuation spectrum. Spectral analysis of radar backscattering along each azimuth direction is performed using the periodogram technique to reduce the speckle noise effect. The fluctuation spectrum is in good agreement with the collocated wave spectra in terms of the wave patterns. An up-to-downwave asymmetry of fluctuation spectrum is found with larger spectral level at the upwave direction for all three spectral beams. The spectral ratio defined between two fluctuation spectral peaks with 180° direction ambiguity, shows distinct values from upwave to downwave directions.

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