The Wide Swath Significant Wave Height: An Innovative Reconstruction of Significant Wave Heights from CFOSAT's SWIM and Scatterometer Using Deep Learning

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Résumé

The accuracy of a wave model can be improved by assimilating an adequate number of remotely sensed wave heights. The Surface Waves Investigation and Monitoring (SWIM) and Scatterometer (SCAT) instruments onboard China-France Oceanic SATellite (CFOSAT) provide simultaneous observations of waves and wide swath wind fields. Based on these synchronous observations, a method for retrieving the SWH over an extended swath is developed using the deep neural network (DNN) approach. With the combination of observations from both SWIM and SCAT, the SWH estimates achieve significantly increased spatial coverage and promising accuracy. As evidenced by the assessments of assimilation experiments, the assimilation of this 'wide swath SWH' achieves an equivalent or better accuracy than the assimilation of the traditional nadir SWH alone and enhances the positive impact when assimilated with the nadir SWH. Therefore, insights into the better utilization of wave remote sensing in assimilation are presented.

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