Estimation and Correction of Geolocation Errors of the CFOSAT Scatterometer Using Coastline Backscatter Coefficients

Kuo Zhang*[1], Xiaolong Dong[2], Di Zhu[3], and Risheng Yun[3]

[1]National Space Science Center, Chinese Academy of Sciences, Beijing – Chine
[2]The CAS Key Laboratory of Microwave Remote Sensing, National Space Science Center, Chinese Academy of Science – Chine
[3]The CAS Key Laboratory of Microwave Remote Sensing, National Space Science Center, Chinese Academy of Sciences and the University of Chinese Academy of Sciences – Chine

Résumé

The scatterometer onboard the China-France Oceanography Satellite (CFOSAT) is the first rotating fan beam scatterometer (CSCAT) in operation. It is used to measure the ocean surface wind fields over a large observation swath. Geolocation is an important part of the preprocessing of scatterometer data. The accuracy of geolocation has a large impact on the accuracy of wind field retrieval. It is necessary to estimate and analyze the geolocation processing of CSCAT. The challenge is understanding how to estimate the geolocation errors of CSCAT. In this study, the coastline inflection method is used to estimate the geolocation errors of CSCAT based on the distribution characteristics of the backscatter coefficients at both the ocean and the land. The coastline inflection points are obtained using the gradient changes of backscatter coefficients near the coastline. The locations of these points are in line with the trend of the high-precision coastline data. The geolocation errors are estimated by comparing these points with the high-precision coastline. The results show that the current geolocation errors of CSCAT are about 7.31 km, which meets the requirements of 25 $\times$ 25 km wind field retrieval. In addition, because the geolocation of scatterometer data is affected by terrain, the geolocation errors of CSCAT are corrected based on an elevation correction algorithm using high-precision digital elevation model data. The results verify the effectiveness of the algorithm.

*Intervenant