Sea Ice Extent Retrieval with Ku-Band Rotating Fan Beam Scatterometer Data

Liling Liu[*1], Jianqiang Liu[2], Wenming Lin[3], Xiaolong Dong[4], Congrong Sun[2], and Shuyan Lang[2]

[1]China University of Mining and Technology, Beijing – Chine
[2]National Satellite Ocean Application Service – Chine
[3]Nanjing University of Information Science Technology – Chine
[4]The CAS Key Laboratory of Microwave Remote Sensing, National Space Science Center, Chinese Academy of Science – Chine

Résumé

Polar sea ice is an important input to global climate models and is considered to be a sensitive indicator of climate change. While originally designed for wind estimation, microwave scatterometers have proven useful for estimating the extent of sea ice. During the China-France Oceanography Satellite (CFOSAT) mission, a novel Ku-band rotating fan beam scatterometer data are used to operationally map the sea ice extent. The paper describes the operational CFOSAT scatterometer (CFOSCAT) sea ice extent mapping algorithm, provides validation comparisons, and presents results from the two-year data product. The algorithm employs a Bayesian classifier with fixed thresholds to segment sea ice and open ocean pixels. To validate the CFOSCAT sea ice algorithm, the CFOSCAT ice extent images are compared with Special Sensor Microwave/Imager (SSM/I)-derived sea ice concentration imagery. Both the SSM/I and CFOSCAT images are presented using similar polar stereographic projections on a 12.5-km grid. In addition, the total sea ice extent area is obtained from the ice-masked imagery by summing the areas of all ice flagged pixels in the sea ice extent images. Sea ice extent area derive from CFOSCAT is compared with the areas resulting from SSM/I images thresholded at various concentration levels. The results suggest CFOSCAT extent correlates very well with the SSM/I 15% extent.

[*]Intervenant