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ANTENNA SIDELOBES EFFECT ON THE MEASUREMENT OF SPACEBORNE MICROWAVE SCATTEROMETER

Abstract

Spaceborne microwave scatterometer is radar specifically designed to measure the ocean surface wind field(including wind speed and direction). A spaceborne microwave scatterometer is one of the main payloads of oceanic satellite or meteorological satellite. In the past, several spaceborne microwave scatterometers used for measurement of ocean wind field have been flown in space, such as SeaWinds, ASCAT, and HY-2 Scatterometer of china. And many microwave scatterometers are planned for flight in the future. The working process of spaceborne microwave scatterometer is that it transmits microwave pulse via the antenna to the ocean surface and measure the backscattered power received at the antenna, and then the normalized radar cross section of the ocean surface can be indirectly calculated using the basic radar equation,and the ocean wind field can be inferred through the relationship between radar cross section and near-surface wind field. The purpose of a spaceborne microwave scatterometer is to obtain a very accurate quantitative measurement. In general, the signal received from the antenna mainlobe is expected, and in fact, the signal received from the antenna sidelobes can contaminate the anticipant signal received from the antenna mainlobe, which has an impact on the precision of scatterometer measurement. The working of this paper is to analyse the antenna sidlobes effect on spaceborne microwave scatterometer's measurement, including nadir sidelobes contamination and near sidlobes contamination, and put forward the method of eliminating.