

Dependency of the normalized radar cross section of ocean surface on the polarization

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Recent years, many satellites with polarimetric synthetic aperture radar (SAR) have been launched. The polarimetric analysis will be applicable for the earth surface including the ocean. However, the knowledge of polarimetric feature of normalized radar cross section (NRCS) is little on the ocean surface. In this paper, the NRCS of ocean surface are measured using an airborne SAR and the dependency on the polarization is analyzed. The NICT and the JAXA has been developed an airborne SAR (Pi-SAR) that is a dual-frequency polarimetric SAR with L-band and X-band. The range of incidence angle is enough wide to acquire the dependency of NRCS on incident angle from one observation, because the swath is more than 10km. Moreover, the time interval of observation of one target is able in less than several minutes. The NRCS of ocean surface depends strongly on the wind over the ocean. The airborne SAR is able to observe same area in enough short time to be ignore the change of wind. The NRCS for parallel polarizations (VV, HH) is much stronger than that for cross polarizations. The large difference represents the ability of Pi-SAR to measure the NRCS for parallel polarizations. The dependency of NRCS on incident angle is different between the radar frequencies and the polarizations. Many observations have done with various weather conditions. The dependency of NRCS on ocean wind will also be presented.