Incidence Angle Considerations for Sea Ice–Open Water Discrimination in Alternating Polarization Data of the Canadian Arctic

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Abstract

The Canadian Ice Service (CIS) is a major operational user of satellite SAR data and has been using Envisat ASAR imagery operationally since spring of 2003, exclusively Wide Swath Mode data acquired through the Canada Centre for Remote Sensing (CCRS) Niche Agreement. Additionally, the Applied Science section at the CIS has been examining Alternating Polarization (AP) mode data to evaluate the potential utility of multi–polarization data for sea ice monitoring, particularly in preparation for RADARSAT–2 wider swath dual–polarization modes. Various studies have been supported and undertaken over the last 2–3 years, with a particular focus on the APH (HH/HV) cross–polarization mode of AP. It was discovered that the cross–pol channel (HV or VH) can be noise limited for discrimination between calm open water and many first–year ice types, particularly thin and new ice. Recently during the late summer and early fall of 2005, three (3) sets of spatially overlapping APH data sets were acquired in the Canadian Arctic. The objective was to further assess the potential of HH/HV data sets with a particular comparison between steep and shallow incidence angle modes. We provide some preliminary results from this analysis and comment on the potential utility for operational sea ice monitoring.