

Oil Spill Detection in the Sea Using ALMAZ-1 SAR

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Abstract

This paper presents the results of oil spill observations using the Almaz-1 SAR collected in the Norwegian Sea during the Dedicated Oil Spill Experiment in 1991. Three artificial slicks were released from a vessel on August 1991 and data on the sea and weather conditions near the test area were collected. The test area was imaged by the Almaz-1 SAR. The analysis of acquired Almaz-1 SAR images shows that the reduction of the backscatter from oil-covered sea surface ranged between 4.4 and 6.5 dB. For the first time an effect of an intensification of wind waves both in the area of the slick and at the windward edge of the oil spill expressed as a magnification of the SAR image brightness has been detected. The increase of relative backscatter power was up to 2.0 dB. It is concluded that Almaz-1 was a valuable tool for oil spill detection and localization but the detectability essentially depended on wind speed, sea state and age of spills.