

Marine oil spills control: SAR monitoring and model prediction.

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ABSTRACT

Preliminary results obtained within the frame of ongoing ISA-IAF Project “Marine oil spills control: SAR monitoring and model prediction (OSCSAR)” are presented. The objective of the proposal is to develop and demonstrate a marine oil spill detection and prediction system based on satellite Synthetic Aperture Radar (SAR) and other space data in combination with models for monitoring and assessment of environmental stress in Russian and Ukrainian seas. The research activities include the following elements:

- Investigation of physical characteristics of crude oil and oil derivatives films (CO/OD) (lab experiment) in order to develop an improved model of short wind wave damping.
- Development of an improved model of radar scattering from the sea surface covered by oil films for different satellite SAR and RAR parameters (wavelength, polarization, incidence angle). This model can be adopted in development of an advanced algorithm of SAR detection of oil spills and their properties.
- Compilation and analysis of spaceborne SAR and RAR images supplemented by in situ measurements related to oil spill and natural films for the study areas in the Northern Seas and Black Sea.
- Implementation of an oil drift model in the Kara Sea region using SAR data as input/validation.
- Dissemination of results showing observational and modelling capabilities towards users and agencies responsible for monitoring of oil spills.

Monitoring of the marine environment by combined use of satellite data, in situ observations and modeling, is one of the important thematic areas of GMES, and extensive efforts are going on in various European sea areas to develop operational monitoring and forecasting systems. To include the eastern European sea in the development of such monitoring and forecasting systems is the main motivation for OSCSAR. The transport of oil and gas from Russia to western Europe by pipelines and tankers via the Northern Sea Route, the Baltic Sea and the Black Sea has increased significantly in recent years and is expected to grow further in the near future. This proposal will develop, demonstrate and assess a monitoring and modeling system using satellite remote sensing as the main data source. Such system has not previously been developed and used in areas such as the Northern Sea Route and the Black Sea