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Author: Dr. Nazif Sattarov
Azerbaijan National Aerospace Agency, Azerbaijan, sattarov47@list.ru

# PECULIARITIES OF AEROSPACE MONITORING'S COGNITIVE MODELLING OF SEA SURFACE OIL POLLUTION BASED ON RADAR AND OPTICAL DATA

**Abstract**

After a large-scale accident in the Gulf of Mexico related to oil spill on the sea surface (2010), a number of ecological issues got importance: 1. Peculiarities of correct joint use of radar and optical data in emergency situations. 2. Necessity of development of a new concept of information support system of aerospace monitoring based on a cognitive model. The purpose of the given study is to develop a methodology most suitable for the water area of the Absheron peninsula in the Caspian sea. Archived satellite data have been used to detect oil slicks on the sea surface. Oil pollution in the water area of the Absheron peninsula is formed as a result of both anthropogenic activities and spills of natural origin. Systematic monitoring of the water area is currently not carried out. As a rule, in order to detect oil slicks on the sea surface, satellites equipped with radars are used. Due to the fact that oil smudges the waved sea surface, the obtained images of slicks are usually high-contrast. Optical data carry important information about an oil spill only in cloudless weather. This study discusses advantages and disadvantages of radar and optical data. As a result of the performed research, the following models have been developed: 1. A cognitive model of preventive analysis of methodological support of on-board imaging system. 2. A cognitive model of peculiarities of radar and optical data usage. Shematic maps have been developed, reflecting: a. Pollution distribution depending on a number of factors (wind, currents) according to Envisat ASAR data. b. Levels (weak, average, deep) of oil pollution of the sea surface in the area of "Oil Rocks" field according to Landsat data. To solve the problem of detecting oil pollution on the sea surface, as well as to determine the type of pollution, additional information is needed. A new research project called "Cognitive Multimedia Modelling of Aerospace Monitoring of Sea Surface Oil Pollution Based on Radar and Optical Data" has been launched. A cognitive interface peculiarities consideration.