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Oil spills and other phenomena on the sea surface: SAR applications

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The images of the Satellite Aperture Radar SAR permit to detect different coherent structures in quasi two-dimensional flows that occur on sea surface, i.e. plumes of rivers, vortices, oil spills, ship wreaks and other phenomena due to the changes of the sea surface roughness. Topological analysis of these surface traces may be use to investigate the different synergetic hydrometeorological process. One of the principal problems of this study is to distinguish between natural and man-made origin of the detected traces (oil spills or slicks). The multi-fractal analysis of the detected SAR images and their structure helps to solve this uncertainty. Also the Doppler frequency associated phenomenon on moving objects is observed on SAR images. The pixel distance between the ship's wake and the apparent position of the ship allows to calculate its real speed from a single equation. The proposed method may be use to determine the sea route of the ship.