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Marine slicks due to inhomogeneous coastal currents

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Field observations of banded slicks on the sea surface aimed to study the relation between slicks and marine currents were carried out in the coastal zone of the Black Sea. Measurements of current velocity profiles were performed from a motor boat with a 600-kHz acoustic Doppler current meter (ADCP). Additionally, current velocities in the thin upper water layer (about 5 mm thickness) were measured using special surface floats when fixing their trajectories with GPS receivers. Samples of surfactant films inside/outside the slicks were collected using a net method, and the films were characterized when studying in laboratory the action of collected films on characteristics of gravity-capillary waves. The studied slicks were also detected in the Envisat SAR imagery.
It is obtained that the banded slicks are characterized by accumulation of surfactants, and are oriented along the coastal currents and approximately along the bottom topography slope. The slick bands in accordance with theory are located in the areas of convergency of weak transverse current components, and can reflect variations of the current velocity profiles and thus the bottom topography features.
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