

TOTAL LUMINESCENT SPECTROSCOPY FOR REMOTE LASER DIAGNOSTICS OF NATURAL WATER QUALITY

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ABSTRACT

The Total Luminescent Spectroscopy (TLS) approach modified for laser remote water quality estimation is developed. Two-dimensional TLS-signatures can serve as representative indicators of both water statistically "normal" state and departures of it. It is shown how, with the aid of laboratory catalogs of signatures for important pollutants, it is possible to detect oils in water at levels substantially below those of spills (of a few $\mu\text{l/l}$), and to identify groups of pollutants against a background of natural suspended matter fluorescence.

A tunable laser remote spectrometer developed by the authors for marine research is described.

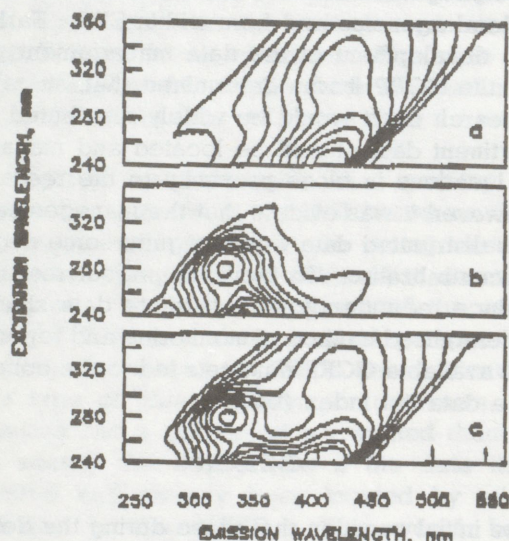


Fig.1. TLS-signatures of natural waters from different aquatoria (remote mode) and of oil dissolved in bi-distilled water (laboratory catalog):
a) pure aquatorium near Lahemaa National Park (Estonia);
b) Siberian crude oil P-01 in bi-distilled water, concentration $5\mu\text{l/l}$;
c) polluted area in the Finnish Gulf.