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**TIME-RESOLVED LASER FLUORESCENT ANALYSIS OF SOLUTIONS,
AEROSOL-CONTAINING AND SOLID SAMPLES**

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Application of the time-resolved spectroscopy in analytical research is aimed at improving the signal-to-noise ratio because of the difference in the useful signal and background kinetics met in many cases. Such differences are most frequently revealed when using the pulsed atomizers or pulsed sources of spectra initiation. Wide spread of pulsed lasers in what concerns atomization of samples and obtaining the analytical signal in combination with photoelectric methods of spectra recording allows to realize successfully the potentialities of the time-resolved spectroscopy.

In this paper the possibilities of improving the signal-to-noise ratio and reducing the detection limits of laser-excited fluorescence analysis of solutions, aerosol-containing and solid samples through the time selection of background radiation are discussed. Strobed hot hollow cathode discharge, spark or laser plum were used as atomizers. Time dependence of the fluorescent signal and background irradiation was investigated. It was shown that in the case of pulsed atomizers combined with pulsed laser exciting fluorescence spectrometry the effective reduction of the background was provided by optimization of the time delay of the moment of fluorescence excitation against the beginning of atomization.

We used the similar way of improving the S/N ratio in the laser-excited fluorescence analysis of Na-containing aerosols in the air with laser breakdown or conventional spark atomization.

This method was successfully used in laser fluorescent analysis of solid samples with pulsed laser atomization as well. Detection limits of Na and Pb in steels and crystals were 10 ppb.

Temporal selection of plasma background was applied for detection limit reduction in analysis of solutions and powdered samples with strobed hot hollow cathode atomization. Detection limits of Co and Ni in solutions were 10 ppt and 1 ppb, correspondingly, and Co in the powdered samples - 1 ppb.