

Reconfigurable Spectrometer Based on the Tunable Broadband Noncollinear Parametrical Amplifier for Time-Resolved Frequency Domain Picosecond CARS.

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Lately we have demonstrated the ability to generate broadband high-intensity laser picosecond pulses using a custom-built OPA based on non-collinear scheme of phase and group velocity matching (NOPA) with injection seeding of the signal wave provided by a broadband cavityless dye laser [1,2]. Now we have implemented this light source for developing of the time-resolved broadband picosecond CARS system for frequency domain applications.

Picosecond broadband CARS spectrometer is intended for work with both pure rotational and ro-vibrational Raman transitions of a number of molecules (H₂, H₂O, CO, CO₂, N₂, O₂), interesting for diagnostics of flames and reacting gas flows.

We carried out the corresponding calculations and realized Folded BOXCARS geometry of light beams interaction in the scheme of CARS-spectrometer for work with as pure rotational, and ro-vibrational transitions of various molecules The special scheme of light beams reconfiguring at NOPA exit was applied for reduction to geometry of Folded BOXCARS.

1. A.K. Vereshchagin, K.A. Vereshchagin, V.B. Morozov, V.G. Tunkin. The 12th European Conference on Nonlinear Optical Spectroscopy (ECONOS) & 32nd CARS Workshop. Book of abstracts, p.66.

2. A. K. Vereshchagin, K. A. Vereshchagin, V. B. Morozov, V. G. Tunkin J. Raman Spectrosc. (2014) DOI 10.1002/jrs.4450.

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