

## O5 (program reference number)

### Laser-induced gratings and measurements in ionic liquids

**Dimitrii N. Kozlov**<sup>1</sup>, J. Kiefer<sup>2,5</sup>, T. Seeger<sup>3,5</sup>, A.P. Fröba<sup>4,5</sup>,  
A. Leipertz<sup>4,5</sup>

<sup>1</sup>*A.M. Prokhorov General Physics Institute, Russia*

<sup>2</sup>*University of Bremen, Germany*

<sup>3</sup>*University of Siegen, Germany*

<sup>4</sup>*University of Erlangen-Nuremberg, Germany*

<sup>5</sup>*SAOT Erlangen-Nuremberg, Germany*

Room temperature ionic liquids are known to have unique properties for a wide range of practical applications as e.g. solvents, reaction media, and electrolytes. Over a wide temperature range various ionic liquids exhibit high dissolving power and electro-conductivity, non-flammability, extremely low vapor pressure and high viscosity, combined with good thermal and electrical stability. The large number of combinations of cations and anions used to compose ionic liquids allows tailoring of fluids with specific properties.

In this work, we present the use of the laser-induced grating (LIG) technique for investigation of four [EMIM]-based ionic liquids with various anion-dependent properties. Generation of LIGs was obtained by quasi-resonant excitation of vibrational overtone and combination CH-bands of the [EMIM] cation around 1064 nm employing a Q-switched Nd:YAG laser. Focusing of the pump and probe laser beams into laser sheets allowed us to determine not only sample thermal diffusivity and sound speed, but also the acoustic wave damping constant in the viscous samples. Furthermore, using the known values of the shear viscosity and the thermal conductivity of the liquids we could derive their bulk viscosity.

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