

Tap water treatment with a laser pulse

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The project focuses on design of a new technique for cleaning of tap water from the micro-inclusions such as small solid particles with a laser pulse. Laser breakdown in liquids (in particular in water) is of considerable interest due to its potential application to on-line analysis of suspended solid contaminants. Most studies of the phenomena of optical breakdown in water refer to the dynamics of the radiation emitted from the breakdown region and only a few address the integral hydrodynamic picture of the process. Taking into account that water (in general) and tap water (in particular) contain numerous suspended particulates, the laser breakdown events must be of discrete character. Therefore, studying only the integral parameters of water cannot adequately describe the process. The time-dependent structure and physical properties of optical breakdown will be investigated using numerical and experimental techniques, which allow for both high temporal and spatial resolutions. The project is multi-disciplinary and involves collaborators from industry (mechanical and medical).