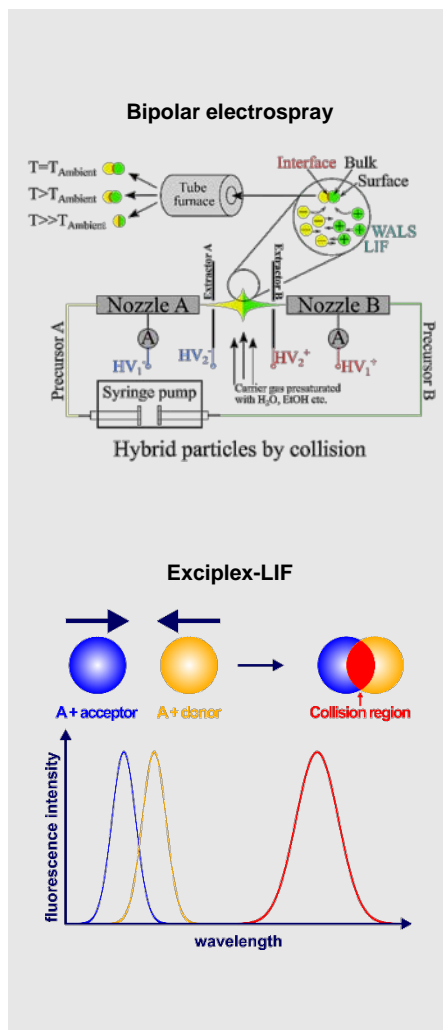


Bachelor thesis  
Master thesis  
Project thesis

## Untersuchung von potenziellen Tracer-Systemen für die Anwendung von Exciplex-LIF in bipolaren Elektrosprays

Supervisor: Simon Aßmann  
Start: now  
Topics: Optical metrology



The central topic of the working group "Particle Measurement" of the Institute of Engineering Thermodynamics (LTT) is the investigation of nanoparticle formation with laser-based measurement methods in order to be able to influence such formation processes systematically by a suitable choice of boundary conditions.

Hetero-nanoparticles consist of two different materials that share a mutual contact surface. They are produced, for example, by bipolar electro sprays (BES), in which two solvents containing different precursors are sprayed into each other. The contact surface of the resulting hetero-particles often exhibits altered physical properties (e.g. charge exchange, heat transfer) compared to the individual components, which can be of great interest for applications in industry, research and medicine. The contact surface is significantly dependent on the number of contact frequency of droplets in the spray.

This quantity is accessible with laser-induced exciplex fluorescence (exciplex: excited complex). In this process, the solvents of the BES are mixed with two different tracers, which form a complex on contact with each other and emit light in a specific spectrum when excited with a laser source. In this work, suitable combinations of tracers for defined solvents should be determined and possible mixing ratios and concentrations for a potential application in BES should be investigated.

Applicants should have an interest in laser measurement technology and be able to work independently. A safe and responsible handling of chemicals is required for the thesis. Experience in programming with Matlab and previous knowledge in the field of optics are an advantage.

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