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Study of transient spark using schlieren imaging

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Transient spark (TS) a pulsed, atmospheric-pressure discharge transitioning between non-equilibrium and equilibrium plasma is important for applications like sterilization. This work focuses on optical diagnostics of the TS is high-speed gas-dynamic behavior. We employed high-speed schlieren imaging to visualize gas density gradients, complemented by numerical simulations of the electric field. Preliminary schlieren results identify three phases: a pre-discharge (initial heating, ionic wind), the main discharge (spark channel formation, shockwave), and a post-discharge (shockwave expansion, heat flux decomposition).

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