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Study on high-density supersonic gas jet targets for laser-driven electron acceleration

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Laser wakefield acceleration is a novel concept for particle acceleration which can provide for a significant reduction of the accelerator length compared to conventional accelerators. The main issue in this field is a lack of control over the injection of electrons into the wakefield, resulting in a large spread in energy of the accelerated electron bunches. For producing this particular density profile, supersonic gas jets are a promising approach which is under intense investigation. The report mainly introduces team‘s the research progress and future plans of the supersonic gas jets providing sharp density gradients in plasma, which can be used for injection of electrons in laser wakefield acceleration.

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