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## **A Confined Continuous-Flow Plasma Source For High-Average-Power Laser Plasma Acceleration**

High average power, kHz laser plasma acceleration (LPA) is an emerging technique which could supply few MeV, few femtoseconds electron bunches with high average current. Such electron beams can be transformative for many industrial applications, for ultrafast pump-probe studies as well as drivers for secondary sources. Tailoring the plasma profile is an essential part, allowing to control both the injection and the acceleration mechanism. Here a novel plasma source for high repetition rate, 10 MeV electron acceleration is presented, consisting of a steady-state flow capillary. It is able to supply a localized and confined gas region ( $\sim 100\mu\text{m}$ ) with sharp density gradients, which are a key feature for both coupling the laser into the gas and injecting electrons. Its tunability and the minimized gas load into the vacuum chamber make this new source a promising candidate for high average power LPA.

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