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## Plasma Density Measurement Using Interferometry.

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Gas-filled capillary discharge waveguides have been used very successfully to extend the length over which acceleration can be maintained in a laser-plasma accelerator, leading to the first generation of 1 GeV beams and, recently, the production of 4 GeV electrons.

We present new transverse interferometric measurements of the plasma channel formed in a gas-filled capillary waveguide driven by two discharge circuits: (i) a conventional thyatron-based circuit; and (ii) a compact Marx bank. These both show the production of a long-lived guiding channels, but the Marx bank driver produces a channel which evolves more slowly.

We also present the first measurements of plasma channels produced in this device with a helium gas fill, which is much more convenient experimentally. The plasma channels formed are found to have similar parameters to those produced with hydrogen.

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