

Abstract Submitted  
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**Generation of high energy density plasmas in ultrafast micro-capillary discharges**<sup>1</sup> GONZALO AVARIA, MICHAEL GRISHAM, FERNANDO TOMASEL, VYACHESLAV N. SHLYAPTSEV, JORGE J. ROCCA, Colorado State University — Important plasma applications depend on the ability to generate hot and dense plasma columns of high homogeneity. We are investigating an scheme for the generation of very hot and dense plasma columns consisting in the rapid excitation of micro-capillary channels with ultrafast current pulses ( $< 3$  ns 10-90% risetime). Model simulations suggest this concept has the potential to heat dense homogenous plasma columns to electron temperatures of 500-1000 eV using modest currents (eg. 30-40 kA). We have conducted experiments in 500  $\mu m$  diameter capillaries filled with different gases that support these predictions. End-on soft x-ray emission was detected by means of Rowland circle and flat field spectrometers with gated detectors. Xenon plasma column with soft x-ray spectra dominated by Xe XXVIII lines were generated.

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