

Abstract Submitted
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First Results from Hollow-Channel Plasma Wakefield Acceleration Experiments with Positron Beams at FACET¹ SPENCER GESSNER, ERIK ADLI, JAMES ALLEN, CHRISTINE CLARKE, SLAC, CHRIS CLAYTON, UCLA, JOEL FREDERICO, SELINA GREEN, MARK HOGAN, SLAC, CHAN JOSHI, UCLA, MICHAEL LITOS, SLAC, KEN MARSH, UCLA, SEBASTIEN CORDE, SLAC, NAVID VAFAEI, UCLA, VITALY YAKIMENKO, SLAC, WEIMING AN, UCLA, E200 COLLABORATION — We report on the first results from a hollow-channel plasma wakefield acceleration experiment using positron beams at FACET. A meter-scale plasma channel is created by field ionizing lithium vapor using an intense laser pulse that has a transverse J8 Bessel profile. The plasma channel is roughly 600 μm in diameter and has unionized vapor at its center. A 20.35 GeV positron beam with spot size of roughly 50 μm was sent through the channel. We observed the transverse beam profile while varying the position of the beam relative to the channel. Our measurements clearly indicate that a plasma channel was formed. We characterize the strength of the wake and discuss plans for subsequent experiments.

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