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New directions in positron plasma wakefield acceleration

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The acceleration of positrons in plasma is a long-standing problem in the field of plasma wakefield acceleration. Recently, several groups have proposed novel techniques for controlling the on-axis plasma electron density in order to provide uniform accelerating and focusing fields for a trailing positron bunch [1,2,3]. In this talk, I will discuss the role of the transverse plasma electron motion in establishing useful fields for accelerating positrons in a variety of plasma geometries.

1. J. Viera, et. al. "Nonlinear Laser Driven Donut Wakefields for Positron and Electron Acceleration." Phys. Rev. Lett. 112, 215001 (2014)
2. N. Jain, et. al. "Positron Acceleration by Plasma Wakefields Driven by a Hollow Electron Beam." Phys. Rev. Lett. 115, 195001 (2015)
3. S. Diederichs, "Positron Acceleration with Beam-Driven Plasma Accelerators." Masters Thesis. DESY (2019).

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