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Progress on the Flat beam PWFA experiment at AWA

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A wakefield experiment at the Argonne Wakefield Accelerator (AWA) facility utilizes flat electron beams with highly asymmetric transverse emittances to drive plasma wakefields in the underdense regime. These beams create elliptical blowout structures, producing asymmetric transverse focusing forces. The experiment utilizes a compact 4-cm-long capillary discharge plasma source developed at UCLA. Analytic models of blowout ellipticity and matching conditions, supported by particle-in-cell simulations, guide the experiment's design. Engineering preparations including the use of windows for vacuum-gas separation, beam transport and diagnostics are discussed. The first beam runs involving flat beam generation and transport is also discussed.

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