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Fueling and Plasma Initiation Tests with a Plasma Gun on the PEGASUS Toroidal Experiment[1] N.W. EIDIETIS, S.P. BURKE, G. FIKSEL, R.J. FONCK, G.D. GARSTKA, E.A. UNTERBERG, G.R. WINZ, University of Wisconsin-Madison — Developing non-inductive startup and efficient fueling techniques is important for the ultralow-A PEGASUS ST experiment, and the ST concept in general. A single low impurity, high current ($\sim$ 1 KA) plasma gun[2] has been installed in the divertor region of PEGASUS to test auxiliary plasma injection and toroidal current drive during plasma startup. This is effectively a form of DC helicity injection. Direct plasma fueling reduces ionization losses during startup, and for a PEGASUS windup factor of 15-25 the gun can provide a significant target I_p ($\sim$ 10 KA) at the beginning of an ohmic discharge. This significantly eases plasma startup, allows access to a much wider range of plasma currents and shapes than present volt-second limitations allow, and provides critical tests for a future multiple-gun array. Experimental results from the single gun tests are reported.

[1]Work supported by U.S. D.O.E. Grant DE-FG02-96ER54375.
[2]G. Fiksel *et al.*, Plasma Sources Sci. Technol. 5, 78 (1996).

☐ Prefer Oral Session
☒ Prefer Poster Session

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Special instructions: Please place as number 6 out of 7 Pegasus posters, before Garstka et al. and after Lewicki et al.

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\Title{Fueling and Plasma Initiation Tests with a Plasma Gun on the {\sc Pegasus} Toroidal Experiment}
\titlenote{Work supported by U.S. D.O.E. Grant DE-FG02-96ER54375.}
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\begin{abstract}
Developing non-inductive startup and efficient fueling techniques is important for the ultralow-A {\sc Pegasus} ST experiment, and the ST concept in general. A single low impurity, high current ($\sim$ 1 KA) plasma gun\footnote{ G. Fiksel {\it et al.}, Plasma Sources Sci. Technol. {\bf 5}, 78 (1996).} has been installed in the divertor region of {\sc Pegasus} to test auxiliary plasma injection and toroidal current drive during plasma startup. This is effectively a form of DC helicity injection. Direct plasma fueling reduces ionization losses during startup, and for a {\sc Pegasus} windup factor of ~15-25 the gun can provide a significant target I_{p} ($\sim$ 10 KA) at the beginning of an ohmic discharge. This significantly eases plasma startup, allows access to a much wider range of plasma currents and shapes than present volt-second limitations allow, and provides critical tests for a future multiple-gun array. Experimental results from the single gun tests are reported.
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