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**Non-inductive production of tokamak-like ST plasmas  
with washer gun sources on the Pegasus Toroidal Experiment<sup>1</sup>**

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sources in the lower divertor region of the Pegasus ST can act as DC  
helicity injection sources for purely non-inductive startup or as pre-  
ionization sources for ohmic induction at very low toroidal field. In  
both applications, use of these edge current sources results in consid-  
erably altered current profiles and suppression of the strong internal  
tearing modes that in the past constrained ohmic plasmas to  $I_P \leq$   
 $I_{TF}$  and relatively low  $I_N$ . At low applied vertical field, the gun-driven  
 $I_\phi$  is large enough to cause a poloidal flux reversal, and the plasma re-  
laxes into a tokamak-like configuration. Discharges of  $I_\phi > 50$  kA are  
produced by  $\sim 4$  kA of injected current, with  $> 80\%$  of  $I_\phi$  persisting  
after the guns shut off. These discharges exhibit features indicative of  
tokamak plasmas, including strong vacuum field deformation, increased  
current decay times ( $> 0.7$  ms), and core heating. They also have very  
high field utilization factor,  $I_P / I_{TF} \leq 2.3$ ,  $I_N > 12$ , and very low  
2/1 mode activity.

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