

**Abstract Submitted for the Fourteenth Topical Conference  
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Category Number and Subject:

☐ Theory     ☒ Experiment

**Stabilization of Tearing Modes by Localized Electron Cyclotron Current Drive,** T.C. Luce, R.J. La Haye, C.C. Petty, R. Prater, Y.R. Lin-Liu, *General Atomics*, F.W. Perkins, *Princeton Plasma Physics Laboratory*, R.W. Harvey, *CompX* — Tearing modes have been demonstrated to limit the  $\beta$  and confinement in conventional ELMing H-mode tokamak regimes. Electron cyclotron current drive (ECCD) has been shown previously to be effective at modifying sawtooth and density limit instabilities. The mechanism to explain the tearing modes which limit  $\beta$  is the destabilizing influence of the missing bootstrap current due to pressure flattening as the island grows. This explanation implicitly assumes the formation of a “seed” island. Experiments on AUG and JT-60U have demonstrated suppression of  $m=3/n=2$  tearing modes in the absence of sawteeth. Recent experiments on DIII-D have demonstrated stabilization of these modes in the presence of sawteeth. Variation of the deposition location indicates the ECCD is highly localized despite the beam traversing a ELMing edge. The predicted ECCD is consistent with tearing mode stability calculations which require current in excess of the missing bootstrap current for stabilization. Experiments for suppression of  $m=2/n=1$  tearing modes are planned.

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☒ Prefer Poster Session  
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