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**Stabilization of Tearing Modes by Electron Cyclotron Current Drive in the DIII-D Tokamak**<sup>1</sup> T.C. LUCE, R.J. LA HAYE, D.A. HUMPHREYS, C.C. PETTY, R. PRATER, General Atomics — Tearing modes set the fusion performance limit of sawtoothing, ELMing H-mode scenarios, which are the prime scenario for burning plasma experiments. Modes with helicity  $m = 3/n = 2$  have been stabilized by precise localization of electron cyclotron current drive (ECCD) within an existing island. A closed-loop feedback control has been successfully implemented to optimize the suppression by either moving the plasma radially or varying the toroidal magnetic field. Using this suppression technique, the plasma stored energy has been raised to values in excess of the value prior to the mode onset. Preliminary experiments on stabilization of the more dangerous  $m = 2/n = 1$  tearing mode have achieved partial suppression. Comparison of the experimental results with theoretical expectations will be presented for both cases.

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Prefer Oral Session  
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T.C. Luce  
luce@fusion.gat.com  
General Atomics

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