

Abstract Submitted  
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**Magnetic island induced bootstrap current on island evolution<sup>1</sup>**

K.C. SHAINING, University of Wisconsin — In a previous paper [K. C. Shaing, and D. A. Spong, Phys. Plasmas **13**, 2006], the effects of the even component (relative to the mode rational surface) of the magnetic island induced bootstrap current on the island dynamics in tokamaks are investigated. The magnetic island induced bootstrap current is a consequence of the symmetry breaking associated with a magnetic island embedded in an equilibrium magnetic field. It is found that island induced bootstrap current density contributes a term that is proportional to the width of the island, and the poloidal plasma beta, the ratio of the plasma pressure to the poloidal magnetic field pressure, to the island evolution equation. This term imposes a lower limit on the absolute value of the tearing mode stability parameter for the island to be unstable at high poloidal plasma beta. The theory is extended here to including the effects of the odd component of the magnetic island induced bootstrap current on the island evolution equation by taking into account the asymmetric island shape relative to the mode rational surface in the derivation of the island evolution equation.

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