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Fast electron generation on MST via radio-frequency waves[1] M.C. KAUFMAN[2], D.R. BURKE, J.A. GOETZ, C.B. FOREST, University of Wisconsin-Madison — Lower hybrid current drive has been proposed as a means of improving confinement in the reversed field pinch by reducing tearing fluctuations. The particular constraints of the Madison Symmetric Torus have led to the use of a novel interdigital-line traveling wave antenna structure rather than the traditional waveguide grill antenna. Since hard x-ray (HXR) flux from bremsstrahlung is a standard indicator for current drive, HXR surveys have been performed up to 160 kW of input power. While there are no definite indications of current drive in the HXR regime at the target absorption region, toroidally localized hard x-rays with energies up to 50 keV have been observed. Monte Carlo modeling supports the hypothesis that gradients in the rf electric fields at the antenna face pull out a high energy perpendicular tail in the distribution. Some fraction of these electrons are lost to the antenna structure. Those not immediately lost are subject to trapping which allows for multiple passes through the near-field and can explain asymmetries in the HXR flux.

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