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Coupling Physics of Unconventional Electron Cyclotron Heating Scenarios for Low Field Devices[1] R.I. PINSKER, C.P. MOELLER, General Atomics, C.B. FOREST, P. CHATTOPADHYAY, M. THOMAS, U. Wisconsin, M.D. CARTER, ORNL — Conventional electron cyclotron heating using the O and X modes to carry energy from the plasma edge to the cyclotron resonance layer is not possible for high density, low magnetic field devices, since these modes are evanescent in most of the plasma. Such conditions are typical of devices such as the reversed field pinch and the spherical torus. However, other wave modes can propagate in the plasma under these conditions. Two examples of such waves are electron Bernstein waves and the electron whistlers. These modes are relatively difficult to excite from the plasma edge, as they do not smoothly connect to electromagnetic waves that can propagate in vacuum. In this poster, coupling to these modes with antenna structures at the edge of the plasma is re-examined theoretically. Experimental results from the Madison Symmetric Torus (coupling and emission measurements) will be compared to simple models, in an attempt to assess the practicality of these schemes for heating and current drive in such devices.

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