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Dimensionless Size Scaling of the H–mode Power Threshold[1] K. KADOTA, Ohio State University, C.C. PETTY, T.C. LUCE, General Atomics — The scaling of the H–mode power threshold with increasing size is an important topic in tokamak physics. If the increase in the H–mode power threshold is more rapid than the increase in the core transported power (at fixed beta) as the tokamak size is increased, then the H–mode threshold may play a dominant role in the global confinement rather than core transport. Following the scale invariance principle, the relative gyroradius (ρ_*) scaling of the H–mode power threshold has been studied in the DIII–D tokamak while holding the other important dimensionless parameters (beta, collisionality, safety factor, shape, *etc.*) constant. Utilizing neutral beam injection heating of the plasma, the scaling of the power flow through the plasma edge near the H–mode threshold condition was measured for a factor-of-1.6 scan in ρ_*. This measurement was made for two different values of the collisionality, which altered the power flow in the electron and ion channels and changed the ρ_* scaling of the H–mode threshold power. A two-fluid analysis of the edge transported power will be shown which will examine separately the ρ_* scaling of the electron and ion power flows near the H–mode threshold condition.

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