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Confinement Trends in DIII-D High Performance Plasmas[1] A. NEFF, Mesa State College, A.M. GAROFALO, T.C. LUCE, General Atomics — A research goal on the DIII-D tokamak is to develop the physics basis for steady-state, high performance plasma operation for ITER and future burning plasma devices. To achieve high fusion power density and steady-state with minimal external power requirements, a fusion reactor requires good energy confinement and high bootstrap (self-generated) fraction of the total plasma current. However, a coarse view of DIII-D and JET databases of high performance discharges suggests a decrease in quality of confinement with increasing noninductive current fraction. To assess this trend, and investigate possible causes, a code is being developed to retrieve and analyze the DIII-D experimental data, and generate a database of high confinement plasma discharges. The code uses specified criteria to evaluate the plasma duration at high confinement, and stores various plasma parameters calculated in this time range. Comparisons of the experimental energy confinement time to various inter-device scaling laws, and the dependence on key plasma parameters will be discussed.

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