Abstract Submitted
for the DPP98 Meeting of
The American Physical Society

Sorting Category: 10 (experimental)

Effect of Dimensionless Size Scaling of Heat Transport in Tokamaks[1] L.Y. SUN, Mt. Holyoke College, C.C. PETTY, T.C. LUCE, D.R. BAKER, General Atomics, M.R. WADE, Oak Ridge National Laboratory — Measuring the relative gyroradius scaling of energy confinement in tokamaks allows the size scaling of heat transport to be determined in a single-sized machine. The relative gyroradius (ρ_*), the Larmor radius normalized to the plasma size, is the only dimensionless variable that needs to be scaled to future ignition devices. Following the scale invariance principle, ρ_* is varied by a factor of 1.6 in the DIII–D tokamak while holding the other dimensionless parameters (beta, collisionality, safety factor, plasma shape, *etc.*) constant. These experiments utilize L–mode plasmas with predominately neutral beam heating. The dependence of the electron and ion heat transport on ρ_* is determined from a radial power balance analysis using the measured profiles of plasma density and temperature. Cross checks of the diagnostic data are used to reduce systematic errors where possible. In addition, the ρ_* dependence of particle transport will be compared to the heat transport scaling.

[1]Work supported by U.S. DOE Contracts DE-AC03-89ER51114 and DE-AC05-96OR22464.

C.C. Petty
petty@gav.gat.com
General Atomics

☐ Prefer Oral Session
☒ Prefer Poster Session

Special instructions: Student Session, immediately following Y. Chu

Date submitted: July 17, 1998 Electronic form version 1.3