

Experimental Validation of Similarity in High Temperature Plasmas

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Abstract

The scaling of energy transport with dimensionless parameters has been measured in high temperature plasmas with the goals of guiding theory and predicting energy confinement in future fusion devices. Validation of this approach requires demonstration of similarity in plasmas with identical dimensionless parameters but very different physical parameters. Within measurement uncertainties, the heat diffusivities and global energy confinement exhibit similarity in high confinement regimes on the DIII-D and JET tokamaks and in low confinement regimes on the DIII-D and AlcatorC-Mod tokamaks.