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Comparison of a 2D Fractional Transport Model with Tokamak Experiments[1] A. KULLBERG, G.J. MORALES, J.E. MAGGS, UCLA, D. DEL CASTILLO-NEGRETE, ORNL — A recently developed [A. Kullberg et al., Phys. Rev. E 87, 052115 (2013)] formulation of fractional transport in two-dimensional geometry, that incorporates finite boundaries, is compared to experimental data from various tokamaks. Fractional transport is a model of non-local transport in which the transport fluxes are expressed in terms of spatial derivatives of fractional order. Local transport (Fick's law) corresponds to the special case of a first order derivative. Model predictions are compared to a broad, worldwide survey of published temperature modulation experiments in tokamak devices. The methodology consists of using the measured equilibrium profiles to deduce the strength of the fractional transport coefficient for a given fractional order. These steady state parameters are subsequently used in the fractional transport code to calculate the behavior of the corresponding heat waves. The calculated phases and amplitudes are compared to the experimental measurements.

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