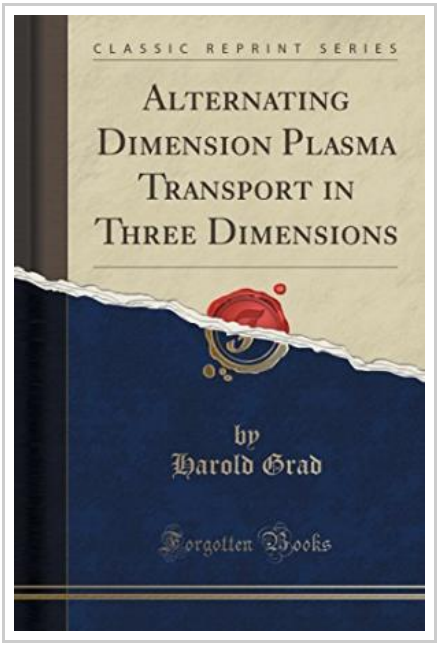

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Alternating Dimension Plasma Transport in Three Dimensions (Classic Reprint)

By Harold Grad

Forgotten Books, United States, 2015. Paperback. Book Condition: New. 229 x 152 mm. Language: English . Brand New Book ***** Print on Demand *****.Excerpt from Alternating Dimension Plasma Transport in Three Dimensions Abstract The alternating dimension(1 1/2 D)method of solving macroscopic adiabatic and transport problems is here generalized to arbitrary 3-D toroidal plasma confinement systems. The principal new result is the derivation of an evolution equation for the poloidal and toroidal fluxes in which second derivatives can be explicitly exhibited to show that the system is diffusive. This extends previous results in 2-D, axial symmetry and helical symmetry, where the flux functions for the magnetic field are explicit consequences of an ignorable coordinate, and the EBT closed magnetic line configuration. The eigenvalues (diffusion coefficients) are evaluated and are shown to represent one-dimensional relative diffusion among the adiabatic variables, independent of the representation (e.g. whether diffusion is measured relative to mass, or toroidal flux, or poloidal flux). The skin effect diffusion coefficient decouples from the other coefficients and represents diffusion of one magnetic field component relative to the other. Other transport coefficients such as those for mass and energy flow are intrinsically coupled. As in previously implemented alternating dimension codes, a...

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