

Turbulence Behavior in the Presence of Transport Barriers

K.H. Burrell

General Atomics, PO Box 85608, San Diego, California, 92186-5608, USA

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Abstract. There is general agreement that the creation of transport barriers in magnetized plasmas is associated with the reduction in turbulence-driven transport. The fundamental physics involved in barrier formation are the effects of equilibrium $E \times B$ shear and zonal flows on turbulence and transport. This paper focuses on three major issues in turbulence and transport barriers: 1) Zonal flows and their effects on turbulence, 2) spatial spreading of turbulence from regions of instability to regions of stability, and 3) the effects of short wavelength turbulence. This work gives a short summary of experimental work bearing on each of the themes and, more importantly, raises fundamental questions to motivate future research in each of these areas.