

# Density Gradient Bifurcation in Tokamaks

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## *Abstract*

Certain drift waves in tokamaks have the property that they become unstable when the temperature gradient exceeds a critical value which increases with increasing density gradient. If instabilities of this type dominate the transport of heat and particles then it will be shown that the particle flux can be a multivalued function of the density gradient. A bifurcation to a reduced transport state can then be driven through the density gradient. The conditions for a bifurcation to exist are derived. In order for this bifurcation to be observable trapped particle instabilities must be suppressed by some other mechanism.