A Two-Field Model of the L→H Bifurcation

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Abstract

A two field model of the L→H bifurcation, originally proposed by Hinton and Staebler[1], is solved analytically. This model evolves density and temperature profiles, with sources. Exact criteria for phase 'co-existence' and confinement bifurcation are derived. In the case where $\chi_L/\chi_H = D_L/D_H$, for which the channels effectively decouple, the co-existence criterion is equivalent to the Maxwell construction. This conclusion differs significantly from that of previous studies. The coupled channel problem is solved as well. Criteria for the origin and nature of hysteresis are discussed. Numerical work is ongoing. Results from that will be discussed.

[1]F.L. Hinton and G.M. Staebler, Phys. Fluids. **5**, 1281 (1993)