

Abstract Submitted  
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**The ideal stability of unity beta tokamaks** P.-A. GOURDAIN, S.C. COWLEY, UCLA — The theoretical stability of unity beta equilibria was left unresolved for many years. Using modern computational tools, unity beta configurations stable to all ideal MHD criteria (Mercier, high-n ideal ballooning, fixed and free boundary modes) have been discovered. They are based on a double equilibrium solution of the Grad-Shafranov equation. The interior solution is highly diamagnetic (reaching unity beta on axis) but usually unstable to free boundary modes. The outer part of the equilibrium is paramagnetic and acts as a perfectly conducting wall surrounding the diamagnetic solution, in effect stabilizing the free boundary modes.

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