

Abstract Submitted
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The Equilibrium β Limit in the W7-AS Stellarator¹ A. REIMAN, M. ZARNSTORFF, D. MONTICELLO, Princeton Plasma Physics Laboratory, Princeton, NJ 08543, A. WELLER, J. GEIGER, Max-Planck Institute for Plasma Physics, D-17491, Greifswald, Germany, W7-AS TEAM — The PIES 3D MHD equilibrium code has been modified to allow the imposition of an experimentally determined pressure profile. To model the equilibrium in the W7-AS experiment, the pressure profile has been determined by the data from the Thomson scattering system and from the set of magnetic diagnostics. PIES equilibrium calculations with varying β indicate that a stochastic region appears at the plasma edge above a threshold value of β , and that the width of the stochastic region progressively increases as β is further increased. The threshold value for the appearance of the stochastic region and the width of the stochastic region depend on the magnitude of the current in the divertor control coils, I_{cc} . The maximum achievable β in the experiment also depends on the value of I_{cc} , and the achievable β correlates with the width of the stochastic region calculated by PIES. The value of I_{cc} has little effect on the shift of the magnetic axis, indicating that the equilibrium β limit is not adequately characterized by the often invoked rule of thumb that assumes that the equilibrium β limit corresponds to a magnetic axis shift of approximately $1/2$ the minor radius.

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