

Abstract Submitted
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Measuring Error Fields in ITER Before Its First Plasma¹ M.G. BELL, S.P. GERHARDT, D. MUELLER, N. POMPHREY, PPPL, A.H. BOOZER, Columbia U. — It is planned to measure the non-axisymmetric field errors in ITER prior to its first plasma operation with the aims of identifying their sources and enabling their effective correction. ITER presents challenges for such measurements because of its scale, its superconducting coils and its use of ferromagnetic components to reduce the toroidal field ripple. For the toroidal field errors, it is proposed to measure the trajectories of an electron beam launched toroidally from a set of points on a contour in a poloidal plane. The trajectories would be measured at several toroidal locations by photogrammetry using fluorescence produced either on screens or in a dilute gas in the vessel. For each of the poloidal field coils it is proposed to measure the distribution of its field normal to a toroidal surface which lies outside the boundary of any plasma but inside all sources of the applied field. The partial flux loops in ITER which span the inner poloidal circumference of the vacuum vessel at several toroidal locations provide a way to measure the normal field from which it would be possible to determine the field in the plasma region. Analyses are being performed to determine the number of measurements and the accuracy required to resolve the Fourier components of the error fields of interest.

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