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Chaotic Magnetic Coordinates in W7-X BEN ISRAELI, Columbia Univ, SAMUEL LAZERSON, STUART HUDSON, Princeton Plasma Physics Laboratory — The effect of symmetry breaking magnetic fields on the island divertor of W7-X is characterized using chaotic magnetic coordinates (Hudson et al., Phys. Plasmas 21, 102505). The ability of the W7-X device to reach high beta long-pulse operation relies on the proper operation of the island divertor. Analysis has suggested that intrinsic error fields may significantly modify the island divertor magnetic field structure in W7-X (Andreeva et al., Nuclear Fusion 55(6), 063025). The impact of such fields on the vacuum field structure is assessed via construction of chaotic coordinates for various W7-X vacuum configurations using code developed by Hudson et al. Chaotic coordinates are constructed via the calculation of a radial framework of quadratic flux minimizing surfaces, which allow the approximation of field geometry in non-integrable fields. This approach enables the analysis of chaotic fields near the island divertor under varied error and trim fields. The effect of the trim and sweep coils on the island divertor is explored in this work.

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