Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

The effect of small 3D magnetic perturbations on linear microinstability properties[1] C.C. HEGNA, University of Wisconsin-Madison — Small externally applied non-axisymmetric magnetic perturbations can significantly alter the edge properties of tokamaks. In this work, we model the effect of the applied 3D fields on the flux surface deformation and show that these can alter key geometric properties of interest to microinstabilities. Shielding physics is assumed to be operative so that flux surface integrity is retained. Local 3D equilibrium theory is employed using a perturbative approach to calculate flux surface deformations consistent with magnetostatic force balance [1]. Prior work has shown applied 3D fields can significantly alter ideal ballooning stability boundaries due to order unity 3D field induced changes to the local shear [2]. The impact of 3D fields on ion temperature gradient and trapped electron mode growth rates are quantified using analytically derived proxy functions.

[1] C. C. Hegna, *Phys. Plasmas* **7**, 3921 (2000).
[2] T. M. Bird and C. C. Hegna *Nucl. Fusion* **53**, 013004 (2013).

[1]Research supported by U. S. DoE grant no. DE-FG02-86ER53218.

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Date submitted: 06 Jul 2014 Electronic form version 1.4