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Gyrokinetic Eigenmode Analysis of High-Beta Shaped Plasmas,* J. Candy, E.A. Belli, *General Atomics* – The effect of compressional magnetic perturbations on gyrokinetic stability and transport in moderate and high-beta shaped plasmas is studied using GYRO. In high-beta plasmas, closely-spaced branches of unstable eigenmodes exist, and are difficult and time-consuming to resolve with existing linear initial-value solvers. For this reason, a fast Maxwell-dispersion-matrix eigenvalue solver has been developed and applied to systematic studies of the linear eigenmode spectrum in representative DIII-D and NSTX discharges. As expected, compressional perturbations are mostly negligible in DIII-D but significant in NSTX for which both low-k, hybrid ITG-like/KBM-like modes as well as high-k mode cascades are observed. Finally, we present a transport analysis for both machines in terms of the full 4—3 transport matrix; that is, four transport coefficients (particle flux, momentum flux, energy flux, anomalous exchange) decomposed into three transport channels (electrostatic, transverse electromagnetic, compressional electromagnetic).

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