

**Abstract Submitted for the 54th Annual Meeting
Division of Plasma Physics
October 29 through November 2, 2012
Providence, Rhode Island**

Category Number and Subject:

Theory Experiment

Effect of Off-Axis Beam Injection on Alfvén Eigenmodes,*

W.W. Heidbrink, Xi Chen, *University of California-Irvine*; M.A. Van Zeeland, *General Atomics*; B.A. Grierson, B.J. Tobias, *Princeton Plasma Physics Laboratory* – Off-axis injection of neutral beams provides new insights into Alfvén eigenmodes (AEs). Off-axis injection flattens the local fast-ion gradient $\nabla\beta_f$ in the core, completely stabilizing reversed shear AEs (RSAEs). In contrast, at larger minor radius, $\nabla\beta_f$ is similar for on- and off-axis injection. As a result, switching the angle of injection has little effect on the stability of global toroidal AEs. Two-dimensional measurements of RSAE mode structure with an electron cyclotron emission imaging diagnostic show that the phase of the eigenfunction varies with radius. The phase variation was originally attributed to symmetry breaking associated with the fast-ion gradient but, unexpectedly, changes in $\nabla\beta_f$ have little effect on radial shearing. The mode structure of lower-frequency beta-induced Alfvén-acoustic eigenmodes (BAAE) is similar to RSAEs. The BAAE real frequency is quite sensitive to $\nabla\beta_f$ but, surprisingly, stability is not.

*Work supported by the US Department of Energy under DE-FC02-04ER54698, SC-G903402, and DE-AC02-09CH11466.