2015 Sherwood Fusion Theory Conference, New York

Modeling of Continuum Absorption of Alfvénic Modes in a Torus

M. Li, B. N. Breizman and L. J. Zheng

Institute for Fusion Studies, The University of Texas, Austin, TX 78712

Abstract

This work presents a numerical analysis of continuum absorption in the Alfvénic frequency range. By introducing a source and a collisional dissipation term, we perform global simulation across the Alfvén continuum spectrum with the ideal MHD code AEGIS [L. J. Zheng and M. Kotschenreuther, J. Comp. Phys. 211, 748 (2006)]. We scan the frequency and calculate the power deposited by the source to reveal resonances associated with global modes and to evaluate the continuum damping rates for these modes. The adaptive grid used in AEGIS enables accurate resolution of Alfvén continuum crossings. We illustrate this approach by revisiting our earlier modeling of the MST experiments [M. Li, B. N. Breizman, L. J. Zheng, et al., Phys. Plasmas 21, 082505 (2014)]. The results demonstrate that the damping rates are minimal and the plasma response to the source is similar to the localized eigenmodes near the localized eigenfrequencies found in previous calculations.