Abstract Submitted
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Alfvén Eigenmodes in Enhanced D-alpha H-mode in Alcator C-Mod[1] J.A. SNIPES, P.T. BONOLI, V. TANG, MIT Plasma Science and Fusion Center, N.N. GORELENKOV, Princeton Plasma Physics Laboratory — Unstable Alfvén eigenmodes are observed in Enhanced D-alpha (EDA) H-mode in Alcator C-Mod at least up to densities of $\bar{n}_e \sim 2.5 \times 10^{20}\mathrm{m}^{-3}$ with strong H-minority ICRF heating. The mode frequencies are typically in the range 400 - 800 kHz. The largest amplitude modes ($\tilde{B}_\theta/B_\theta \sim 5 \times 10^{-5}$ at the wall) often agree in frequency with the expected Toroidal Alfvén Eigenmode (TAE) frequency ($\omega_{TAE} = \mathrm{v}_A/2qR$) for q=1, indicating that these are core modes. The calculated effective fast ion tail energy $\sim$ 50 keV corresponds to $\mathrm{v}_F/\mathrm{v}_A \sim 0.4$. These modes are observed to rotate in the electron diamagnetic drift direction, which is opposite to the rotation direction expected for TAEs with a peaked fast ion distribution. Recent calculations with the AORSA and CQL3D codes [1] indicate that the fast ion distribution in C-Mod may be hollow because of poor wave focussing and preferential heating of trapped particles along the resonance. The opposite sign of the gradient of a hollow profile of the fast ion β would then explain the opposite direction of rotation. NOVA-K modelling will be used to compare the stability of L and H-mode conditions and determine the radial structure of these modes.
[1] E. F. Jaeger, et al, to be published in Plasma Physics and Cont. Fus.

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