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[] Theory [] Experiment

Alfvén Eigenmode Induced Fast Ion Transport in DIII-D Resulting From Finite Larmor Radius Effects,* G.J. Kramer, G.Y. Fu, R. Nazikian, *PPPL*; M.A. Van Zeeland, R.K. Fisher, D.C. Pace, *GA*; L. Chen, X. Chen, W.W. Heidbrink, *UCI* – Alfvén Eigenmode (AE) induced fast-ion redistribution and loss are commonly observed in DIII-D. In those experiments the perpendicular wave vector times the fast-ion Larmor radius is of order unity ($k_{\perp}\rho_i \sim 1$), which allows fast ion orbits to traverse the AE mode structures asymmetrically causing a significant change in magnetic moment. Full-orbit simulations of the expected transport in DIII-D plasmas show that this effect can lead to fast-ion radial diffusion constants of $5 \text{ m}^2/\text{s}$ at the measured mode amplitudes. This level of diffusion is not captured with a guiding center approximation and is in agreement with that deduced in DIII-D experiments when AE activity was present.

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