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Microturbulence-mediated route for stronger energetic ion transport and Alfvnic mode intermittency in ITER-like tokamaks[1] NIKOLAI GORELENKOV, VINICIUS DUARTE, Princeton Plasma Physics Laboratory —

We report on a theoretical discovery of new regimes of Alfvn eigenmode (AE) induced fast ion transport in tokamak plasmas, where microturbulence plays the role of a mediator of fast ion relaxation. Coulomb collisional scattering alone leads to relatively small AE amplitudes in ITER-like plasma conditions and does not reproduce the steady state regimes observed in present day experiments in conventional tokamaks. We show that in nonlinear regimes the effective pitch angle scattering due to microturbulence can lead to steady state AEs with up to an order of magnitude higher amplitudes since the microturbulence scattering is expected to be 2-5 times stronger than the Coulomb scattering. This indicates a new route for fast ion radial transport and its intermittency, which are beyond the scenarios described in Energetic ion transport by microturbulence is insignificant in tokamaks [D. C. Pace et al., Phys. Plasmas 20 (2013) 056108]. The increase of AE amplitudes due to microturbulence in predictive simulations for burning plasmas was ignored earlier but needs to be accounted for when designing future plasma scenarios.

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