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Scaling of magnetic perturbation level for tearing mode turbulence during disruption DI HU[1], AMITAVA BHATTACHARJEE, Princeton Plasma Phys Lab — A model is presented regarding the magnetic perturbation saturation level for tearing turbulence during disruption. We consider a scenario where large scale tearing modes overlap with each other, break the flux surfaces and stir up a spectrum of small scale tearing modes. Two properties are of interest: one is the saturation level of turbulent perturbation, the other is the corresponding radial correlation length. The former is important because that the dominant contribution to the turbulent diffusion and hyper-resistivity scales as perturbation strength squared. The latter is important for transport of high energy particles in the random field. The aim of this model is to get a scaling of those two properties with respect to resistivity, instability drive and major geometry parameters. To this end, two specific cases are considered, one in which the flux surfaces are partially broken and the other when the whole plasma is stochastic. In both cases, we find the saturation level by balancing the linear drive which inject energy into the turbulence, and the forward cascade rate which transfer energy toward finer scales. The corresponding radial correlation length is then determined from the saturation level. Resistive MHD simulation are also presented to test the analytical model

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