

Formation of laminar flux tubes due to resonant magnetic perturbations in DIII-D

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ABSTRACT

The splitting and deformation of the separatrix due to externally applied resonant magnetic perturbations is shown. The resulting footprint pattern on the divertor target plates is shown in high resolution by means of the connection lengths and penetration depths of the magnetic field lines. Substructures inside the stripes are discovered. Deep penetrating long connecting fractal regions, which are related to the internal resonances by their manifolds, alternate with regular short connecting regions. The latter are identified as compact laminar flux tubes, which perforate the perturbed plasma region close to the x-point. The properties and consequences of such flux tubes are investigated in detail. Results are compared to heat and particle flux measurements at DIII-D.