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ECRH and its effects on neoclassical transport in stellarators[1]
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— The effect of ECRH heating on the neoclassical transport of stellarators is addressed. We present a calculation that proceeds by solving for the lowest order electron distribution function using a Fokker-Planck equation including the effects of ECRH. A lowest order energetic electron population is described by balancing collisions off of a background Maxwellian plasma and ECRH heating as described by a quasilinear diffusion operator. Finite ECRH beam width and relativistic detuning effects are accounted for in the diffusion operator. Radial particle fluxes are calculated from the 1st order corrections to the kinetic equation. With the presence of a large energetic trapped electron population, enhanced neoclassical transport is generally expected in low collision frequency plasmas. However, a self-consistently generated E X B poloidal drift reduces the direct losses of trapped electrons. Progress in using ambipolarity constraints to determine the radial electric field and implications for the achievement of electron root and associated enhanced confinement regimes will be addressed.

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