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**ECRH and its effects on neoclassical transport in stellarators**
JAECHUN SEOL, C.C. HEGNA, University of Wisconsin-Madison — The effect of ECRH heating on the neoclassical transport of conventional stellarators is addressed. In the absence of symmetry, neoclassical transport of stellarators is not favorable in the low-collisional regime. This transport mechanism is particularly important in ECRH heated plasmas where a large energetic trapped electron population is produced. However, a self-consistently generated EXB poloidal drift reduces the direct loss of trapped particles. A large radial electric field is built up by energetic trapped particles generated by electron cyclotron resonance heating (ECRH) yielding the "electron root." We present a calculation that proceeds by solving for the lowest order electron distribution function using a Fokker-Planck equation for ECRH. Energetic electron generation is modeled using a quasilinear model ECRH diffusion. The radial particle fluxes are calculated by solving the $1^{st}$ order Fokker-Planck equation. The radial electric field is determined from the ambipolarity condition of the particle fluxes. Implications for the achievement of electron root and associated enhanced confinement regimes will be addressed. For sufficiently large applied ECRH fields, the quasilinear description of wave-particle interaction is not generally valid. Efforts to extend the diffusion operator to account for nonlinear effects will be addressed. * Research is supported by U.S. Department of Energy Grant No. DE-FG02-99ER54546

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