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The effect of density fluctuations on ECRH beam broadening and implications to NTM mitigation on ITER ANTTI SNICKER, LORENZO GUIDI, ALF KOHN, OMAR MAJ, HANNES WEBER, EMANUELE POLI, Max-Planck-Institut fur Plasmaphysik, Garching — We present state-of-the-art computations of propagation and absorption of electron cyclotron waves, retaining the effects of scattering due to density fluctuations. In ITER, injected microwaves are foreseen to suppress NTMs by driving current at the resonant surface(s). The good localization of the absorption profile can be spoiled by beam scattering and impair the NTM control capabilities. A novel tool based on the wave kinetic equation has been developed, which retains diffraction, an integral form of the scattering operator assuming the Born scattering approximation, full tokamak geometry and determination of the power absorption profile. This approach has been implemented in the code WKBeam, which has been benchmarked against the beam-tracing code TORBEAM and the full-wave code IPF-FDMC, in particular to verify usage of the Born approximation for ITER parameters. We show that in ITER the radiation transport is diffusive unlike in existing machines. Using WKBeam we demonstrate through parameter scans that the width of the deposition profile in ITER depends on the assumptions on the fluctuations and beam parameters: the effect can be of the order of 100method to quantify mode-to-mode scattering induced by fluctuations has been developed and first results are presented.

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