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Quasioptical modeling of the power deposition by mode-converting wave beams in fusion plasmas KOTA YANAGIHARA, Nagoya University, ILYA DODIN, Princeton Plasma Physics Laboratory, SHIN KUBO, National Institute for Fusion Science — Electron-cyclotron heating and current drive with mm waves require modeling of the power deposition with high precision. Multi-dimensional full-wave simulations are prohibitively expensive at these wavelengths, and ray- and beam-tracing techniques are not sufficiently accurate in many practical applications. We report quasioptical modeling of the power deposition by mm-wave beams using a new code PARADE (PAraxial RAy DEscription), which was recently presented in [arXiv:1901.00268, arXiv:1903.01357, arXiv:1903.01364; to appear in Phys. Plasmas]. The beam transverse structure is calculated from first principles with the inhomogeneity of the absorption coefficient taken into account. The simulations also account for beam refraction, diffraction, and mode conversion, such as the X–O mode conversion at the fusion plasma edge caused by the magnetic shear.

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