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Short_Oral_47: Application of FDTD algorithm to the analysis of polarization state evolution in tokamak plasma

Equations of Stokes vector formalism or the technique of angular variables are usually used to analyze the evolution of the electromagnetic wave polarization state in a tokamak plasma. Both approaches assume that plasma is a weakly anisotropic and smoothly inhomogeneous media. The description of polarization changes for the plasma that does not meet these assumptions (e.g. in the region of turbulent plasma) requires a numerical solution of Maxwell's equations. In such a case the finite-difference time-domain (FDTD) method can be used. This paper presents a computational algorithm based on the FDTD method. To test the software, a linear polarized wave propagation through the magnetized tokamak plasma has been simulated and compared to the solution based on the angular variables technique in selected plasma conditions.

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