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Improvement of the plasma current density profile by the polarimeter/interferometer system on the EAST tokamak

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A novel method has been developed to improve the accuracy of plasma current density profile by combining the polarimeter/interferometer (POINT) measurements with the external magnetic measurements on the EAST tokamak. The POINT system, measuring the accurate line-integrated electron density and Faraday rotation angle, provides the magnetic field information inside the plasma. By adding these data to the equilibrium confinement, the results from POINT measurements show a difference with the original equilibrium and the difference becomes larger from boundary to core of the plasma. This correction process makes up for the deficiency of magnetic probe measurements, the details of the correction process are specified, which bypass the equilibrium fit (EFIT) code. Results with and without these corrections are presented, comparisons of the corrected results and experimental results are also shown and they are found agree well with each other. The feasibility and reliability of the correction process are also discussed in this paper.

Eligible for student paper award?

Yes

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