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TH/P2-14: Predictive Transport Simulations Consistent with Rotation and Radial Electric Field Using TOPICS with OFMC

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A toroidal momentum equation solver newly implemented in TOPICS calculates a temporal variation of a total toroidal momentum with an external torque input by OFMC. A solid scheme that can calculate parallel, poloidal and toroidal flows, and thus the radial electric field E_r is developed using the Matrix Inversion method. The coupling of the solver and the scheme with the aid of OFMC provides a means to investigate complex phenomena involving E_r and toroidal rotation. The simulations show the importance of inward pinch, the residual stress and the boundary condition for estimating toroidal rotation. Predictive capability we gained helps us seek the controllability for upcoming JT-60SA and ITER.

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