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# Gyrokinetic Modeling of Turbulent Particle Fluxes towards Efficient Predictions of Density Profiles

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A novel quasilinear particle transport model is constructed by joint analyses with gyrokinetic calculations and JT-60U experimental data. The new model deals with the diagonal (diffusion) and off-diagonal (pinch) transport mechanisms individually. Besides the decomposition, realistic particle sources from neutral-beam fueling are taken into account, which have not been discussed in earlier studies. Taking advantage of the features offered by the model, (i) the contribution from each transport mechanism to particle fluxes is quantitatively clarified, and (ii) a framework is developed, which enables us to predict the particle fluxes accurately and quickly, taking a neural-network-based approach. Moreover, (iii) a scaling formula is derived, considering linear zonal flows to understand mechanisms which determine the particle fluxes.

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