PiAI Seminar Series: Physics informed AI in Plasma Science
9:30-10:30, 15 November 2021 (CET)
17:30-18:30, 15 November 2021 (JST)
Web Seminar

ASTI: Data Assimilation System for Particle and Heat Transport in Toroidal Plasmas

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Abstract

ASTI, a data assimilation system for integrated transport simulation of fusion plasma, has been developed to analyze, predict, and control the fusion plasma behavior. ASTI employs the ensemble Kalman filter (EnKF) and smoother (EnKS) as data assimilation methods and the integrated transport simulation code for helical fusion plasma, TASK3D, as the system model. In this study, ASTI assimilates the time-series data of measured temperature and density radial profiles into the particle and heat transport simulation. We apply ASTI to the time series data sets of the 12 NBI heated plasmas in LHD. The obtained profiles and temporal variations of temperature and density by the EnKF and EnKS agree well with measured ones due to the optimization of the employed model parameters. These results indicate the effectiveness and validity of ASTI for accurate prediction and analysis of the behavior of fusion plasmas.