04aE50P

LHD実験データから輸送解析コードへの連係動作システムの構築と拡張
Enhanced Interlink between LHD Experiment Data and Transport Analysis Suite

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In magnetically confined torus experiment, it would be helpful for more efficient transport analysis to construct routine data flow from measured profiles through numerical code calculations. We have recently demonstrated such an automated analysis to enhance interlink between Large Helical Device (LHD) experiment data and an integrated transport analysis suite of codes by developing a magnetic coordinate mapping system and interface routines. Figure 1 shows data flow in the conventional and new schemes for transport analysis. The magnetic coordinate mapping system called TSMAP (Thomson Scattering MAPping) [1] has been employed to express measured profiles (electron density/temperature, etc.) as functions of effective minor radius. TSMAP is based on new large-scale databases of pre-calculated equilibrium and inverse mapping results along the line of sight of Thomson scattering diagnostic, and it finds a best-fitted equilibrium minimizing the inboard/outboard asymmetry of the electron temperature profile.

The mapped profile data are automatically stored as analyzed data in our *Kaiseki* (analysis) data server system as well as the derived equilibrium parameters. The registered data are called from interface routines to give the input files to each module of the transport analysis code suite TASK3D-a [2] which consists of modules for equilibrium re-calculation, heating with/without beam slowing-down effect, and energy balance for steady-state/dynamic transport analysis. These tools realize analysis of fast temporal evolution of transport [3], and to generate a large-scale experimental database of transport analysis by calculating a number of shots automatically.

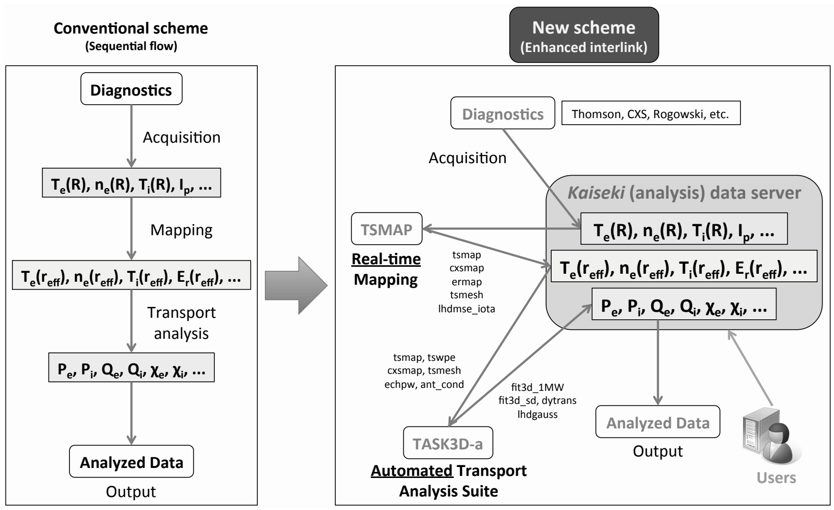

図 1: **Conventional and new schemes for transport analysis.**

[1] C. Suzuki *et al.*, Plasma Phys. Control. Fusion **55**, 014016 (2013).
[2] M. Yokoyama *et al.*, Plasma Fusion Res. **8**, 2403016 (2013).
[3] K. Ida *et al.*, Phys. Rev. Lett. **111**, 055001 (2013).