Contribution ID: **165** Type: **Talk**

【214】Characterization of Jacobian Free Newton Krylov algorithm to solve the free boundary equilibrium problem

Thursday 24 August 2017 15:00 (15 minutes)

The ITER actuator controllers will need numerical test and tuning with a "tokamak simulator"based on 1.5MHD equilibrium/transport model, ideally during pre-shot operation.
Coupling the equilibrium code LIUQE and transport code RAPTOR, the fastest available to our knowledge in their categories, would provide a fast and control oriented simulator for this purpose.
A stable, flexible and fast numerical method to solve for the non-linear coupling is sought. The Jacobian Free Newton Krylov method is investigated in terms of stability against initial conditions and minimum number of evaluations of the non-linear function required.

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Session Classification: Applied Physics & Earth, Atmosphere and Environmental Physics (Combined Session), Plasma Physics

Track Classification: Applied Physics and Plasma Physics