

Implementation of feedback schemes in SOLPS-ITER 3.0.8.

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The SOLPS-ITER code [1, 2] is a two-dimensional code that describes near-wall plasma and solves the system of Braginskii equations for a strongly ionized plasma. The stationary solution of such problem depends in a complex way on the input parameters of the calculation, which makes it difficult to solve the inverse problem: search for input parameters that would lead to the desired plasma solution.

To speed up the selection of these parameters, feedback schemes were introduced [3]. Their principle of operation is that one of the input parameters is selected iteratively, evolving along with the solution to the desired one. For example, there is a scheme for finding such puff of radiating impurity in the TRT tokamak, as provides the desired percentage of it on the separatrix. Such relationship can be introduced for a large number of initial parameters of the problem.

This work was mainly focused on the relationship between gas puffing and various plasma parameters (Effective charge, impurity fraction on the separatrix, total number of particles in the computational domain, etc.).

References

- [1] V. A. Rozhansky et al 2001 Nuclear Fusion 41.4 387.
- [2] V. A. Rozhansky et al 2009 Nuclear fusion 49.2 025007.
- [3] E. Kaveeva et al 2018 Nuclear Fusion 58.12 126018.