

Experimental results on RF power absorption maximization using extremum seeking at FTU

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We report on experimental results related to a recently proposed algorithm for the maximization of the absorbed power delivered by the Lower Hybrid antennas installed on FTU [3] during plasma heating or non-inductive current drive experiments. The developed algorithm is based on a novel extremum seeking scheme whose details have been given in [1], where simulation results related to the FTU experimental scenario addressed here were provided. The new extremum seeking scheme had never been tested experimentally before even though the simulation results in [1] anticipated an improved effectiveness as compared to the previous solutions proposed in [2] and references therein.

In this paper we illustrate the experimental implementation of the algorithm on the FTU real-time plasma position control system, which is being migrated towards the emerging real time framework MARTe [4]. We then discuss the experimental results and compare them with the results predicted by the simulations and to the results achievable using the previously proposed algorithms. In particular, increased robustness and performance of the new scheme will be discussed and illustrated by way of a mixture of experimental and simulation results.

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