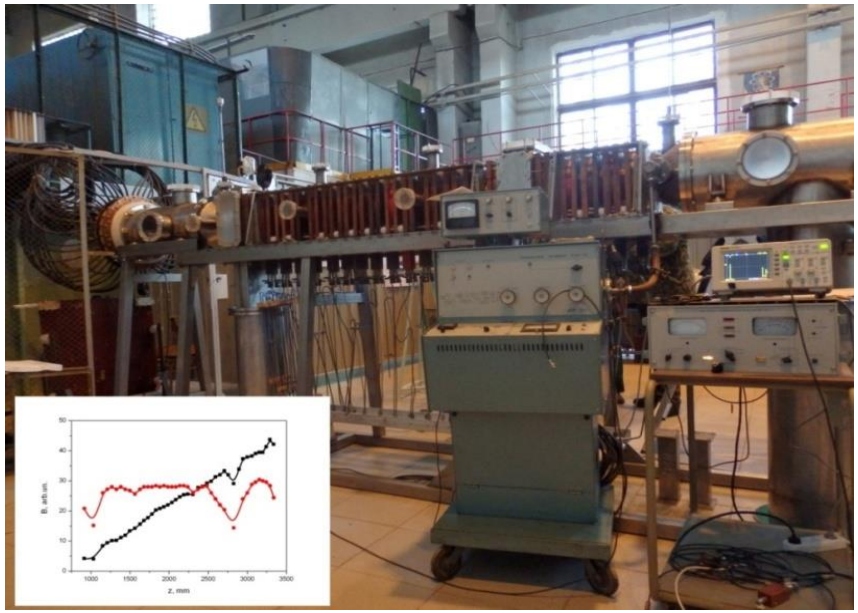
Novel Test-bed Facility for PSI Issues in Fusion Reactor Conditions on the Base of Next Generation QSPA Plasma Accelerator

MPT/P5-32

I.E. Garkusha[1], V.V. Chebotarev[1], S.S. Herashchenko[1], V.A. Makhlaj[1], N.V. Kulik[1], M.S. Ladygina[1], A.K. Marchenko[1], Yu.V. Petrov[1], V.V. Staltsov[1], P.V.Shevchuk[1], D.G.Solyakov[1], D.V. Yelisyeyev[1]

[1] Institute of Plasma Physics, NSC "Kharkov Institute of Physics and Technology", 61108, Kharkov, Ukraine



QSPA with external B-field up to 2 T has been developed and novel test-bed facility has been constructed. It allows new level of plasma stream parameters and its wide variation in new QSPA-M device, as well as possible combination of steady state and pulsed plasma loads to the materials during the exposures. First plasma is recently obtained. Careful optimization of the operational regimes of the plasma accelerator's functional components and plasma dynamics in the magnetic system of QSPA-M device has been performed approaching step by step the necessary level of plasma parameters and their effective variation.

The obtained results demonstrate ability of QSPA-M to reproduce the ELM impacts in fusion reactor both in term of heat load and particle flux to the surface.