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14.10 Preliminary test of the Laser-driven Ion-beam Trace Probe in the PKU Plasma Test device

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The Laser-driven Ion-beam Trace Probe (LITP) is a new method to diagnose the Bp and Er in tokamaks [1, 2]. It takes full use of four characters of the Laser-driven Ion beam: large energy spread, large pitch angle distribution, short pulse and multiple charge states. Here preliminary experimental results of LITP will be reported. In 2017, lots of LITP experiments were done on the PKU Plasma Test (PPT) device. The experimental system includes scintillator detectors, poloidal magnetic coils and a penning ion source instead of the Laser-driven Ion-beam. These first-step experiments show that LITP worked well. Furthermore, a laser-driven accelerator has been set up next to the PPT device and a series of experiments will take place in early 2018. The laser-driven accelerator, the scintillator detector and the reconstruct method will be tested to examine the LITP system. Besides, the scintillator-CCD system will be tested in HL-2A tokamak using a probe platform to identify its performance under tokamak environment. After that, a prototype system will be designed aimed at HL-2A, EAST and HL-2M tokamaks.

[1] Yang et al. RSI 85(11), 11E429 (2014).

[2] Yang et al. RSI 87(11), 11D610 (2016)

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