Abstract Submitted
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**Maximum entropy reconstruction of poloidal magnetic field and radial electric field profiles in tokamaks**[1] YIHANG CHEN, CHIJIE XIAO, XIAOYI YANG, Peking University, TIANBO WANG, Southwestern Institute of Physics, TIANCHAO XU, Peking University, YI YU, University of Science and Technology of China, MIN XU, Southwestern Institute of Physics, LONG WANG, Chinese Academy of Science, CHEN LIN, Peking University, XIAOGANG WANG, Harbin Institute of Technology — The Laser-driven Ion beam trace probe (LITP) [1, 2] is a new diagnostic method for measuring poloidal magnetic field ($B_p$) and radial electric field ($E_r$) in tokamaks. LITP injects a laser-driven ion beam into the tokamak, and $B_p$ and $E_r$ profiles can be reconstructed using tomography methods. A reconstruction code has been developed to validate the LITP theory, and both 2D reconstruction of $B_p$ and simultaneous reconstruction of $B_p$ and $E_r$ have been attained [2]. To reconstruct from experimental data with noise, Maximum Entropy and Gaussian-Bayesian tomography methods were applied and improved according to the characteristics of the LITP problem. With these improved methods, a reconstruction error level below 15% has been attained with a data noise level of 10%. These methods will be further tested and applied in the following LITP experiments. [1] X. Y. Yang et al. Rev. Sci. Instrum. 85(11), 11E429 (2014). [2] X. Y. Yang et al. Rev. Sci. Instrum. 87(11), 11D610 (2016).

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