4th Asia-Pacific Conference on Plasma Physics, 26-31Oct, 2020, Remote e-conference

Linear Experimental Advanced Device and Some Recent Experimental Results

H.J. Wang[1], H. Liu[12], Y.X. Zhu[1], R. Ke[1], S.B. Gong[1], J.B. Yuan[1], C.Y. Wang[1], L. Nie[1], T. Che[1]. Z.H.Wang[1], M. Xu[1]and HL-2A team[1]
[1] Southwestern Institute of Physics, Chengdu, China
[2] University of Science and Technology of China, Hefei, China

E-mail: wanghuajie@swip.ac.cn

LEAD (Linear Experimental Advanced Device), Fig.1, has been successfully built in SWIP (Southwestern Institute of Physics) and the main purposes of this device are used for studying Tokamak edge plasma turbulence and researching the PMI (Plasma and Material Interaction). The diagnostic vacuum chamber is 1505 mm long with 400 mm diameter and the PMI chamber is 1550 mm long with 900 mm diameter. The background vacuum pressure can reach 10^{-5} Pa and the working vacuum pressure is between 0.1-1.5 Pa, always 0.6 Pa. It has 15 magnets and the magnetic field intensity reaches 3000Gs with less than 1% waviness at the magnetic axis. RF wave plasma source with 2-5 kW power produces 2-5 eV electron temperature, neon is the discharging gas. During one of the power scan experiments, the higher RF power and the higher plasma density. It reaches $10^{19}m^{-3}$ around the axis with 3000W source power, Fig.2.

LEAD which is one of the biggest and parameter highest linear plasma scientific experimental devices in China. Langmuir probes array and 3D magnetic probes (It has three groups and each one circles around the vacuum chamber, two in diagnostics chamber and one in PMI chamber) are the main diagnostics now, besides , GPI、CIS、LIF diagnostics are developing now and many other diagnostics will be developed in the future. In recently experiments, we carried out some plasma turbulence experiment and got some basically result.

References
[1] Liu, H., et al. "Design of magnetic configurations for the linear plasma device LEAD." Fusion Engineering and Design, 144 (2019): 81-86.

Figures

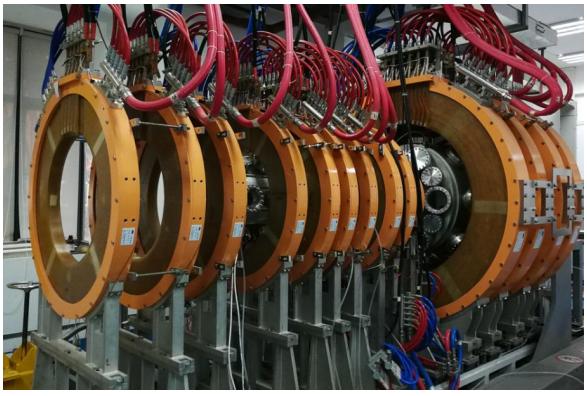

Fig.1 General picture of LEAD

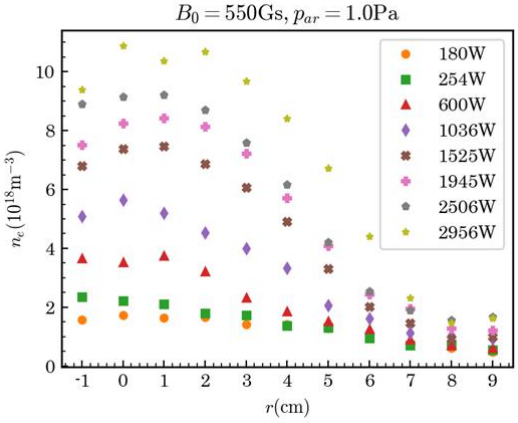

Fig.2 Profile of plasma density with the RF power scan step by step.