Power Modulation System of Lower Hybrid Wave on EAST

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To satisfy various requirements of different physics experiments, a new power modulation method of lower hybrid wave (LHW) has been developed in Experimental Advanced Superconducting Tokamak (EAST)[1], including the development of a control source combining software and hardware for power modulation. Such modulation system (shown as Fig.1) is realized by the main positive-intrinsic-negative (PIN) diode switch located at the oscillator, different from the previous one realized by the sub PIN diode switches. The new LHW modulation system has been installed and tested, demonstrating that the modulation parameters can be controlled flexibly. The maximal modulation frequency is about 10 kHz, which is limited by the hardware speed. The system has been successfully used to study the influence of LHW on the performances of plasma. Under the modulation of LHW, strong mitigation of edge-localized modes (ELMs) has been observed[2, 3], and ELM pace-making technique has been demonstrated[4]. Further experimental studies with the modulation system will be continued in EAST.

References

[1] Y.X. Wan et al., 21st IAEA FEC, OV/1-1

[2] B.N. Wan et al., Nucl. Fusion 53, 104006 (2013)

[3] Y. Liang et al., PRL 110, 235002 (2013)

[4] G.S. Xu et al., 26th IAEA FEC, EX/10-2

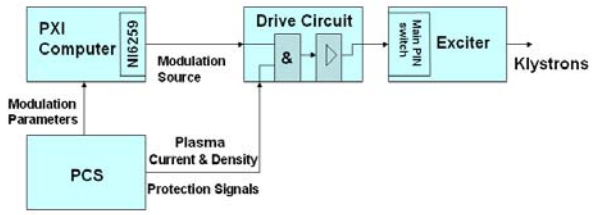

Figure1. The new LHW modulation system on EAST