

## Real-time power measurement of ECRH on HL-2A

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### **Abstract:**

Power is a very important parameter in electron cyclotron resonance heating (ECRH) system. A directional coupler has been presented in this paper, which aims to monitor the microwave power of the transmission line in real-time for ECRH system on HL-2A. The directional coupler designed bases on the theory of electromagnetic coupling through aperture. To obtain high directivity, a hole-array was designed in the flat mirror surface of miter bend. A prototype of the directional coupler has been fabricated according to the theoretical calculation. Then a calibration experiment for this directional coupler is done and the results show that the calculation results are coincident with the experiment ones. Finally, the directional coupler is applied to measuring power in ECRH system and analyzing the operation status of the gyrotron. Successful development of the directional coupling has important significance for safe operation of gyrotron and promoting the real-time analysis ability of data in EC wave injection experiment.

**Key words:** HL-2A, ECRH, Power measurement