

8 - 7 Development of a Movable Standing Wave Resonant Ring Test System for High Power Couplers

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Off-line high-power tests of the power couplers for cavities prior to their on-line operations are of importance for ensuring their operating reliability and stability. To test the couplers using a limited power supply effectively, a standing wave (SW) resonant-ring test system with two power input ports has been developed at the Radio Frequency Cavity Group. The schematic view of the new test system is shown in Fig. 1. The field in the SW ring is combination of two waves moving in opposite direction, therefore, the power gain is 4 times as the traveling wave (TW) resonant ring. The SW resonant field inside power couplers can be shifted for a distance more than half a wavelength by changing the phase-difference of the input power. Proof-of-principle structure of the system has been built and tested both at the low-power and at the high-power levels. Two prototype power couplers for QWR cavities in HIAF and four power couplers for RFQ in CiADS are tested and conditioned successfully with the SW resonant ring. The test results indicate that a power gain of 80 is obtained for the QWR power couplers and the maximum power of 100 kW is achieved for the 162.5 MHz power couplers.

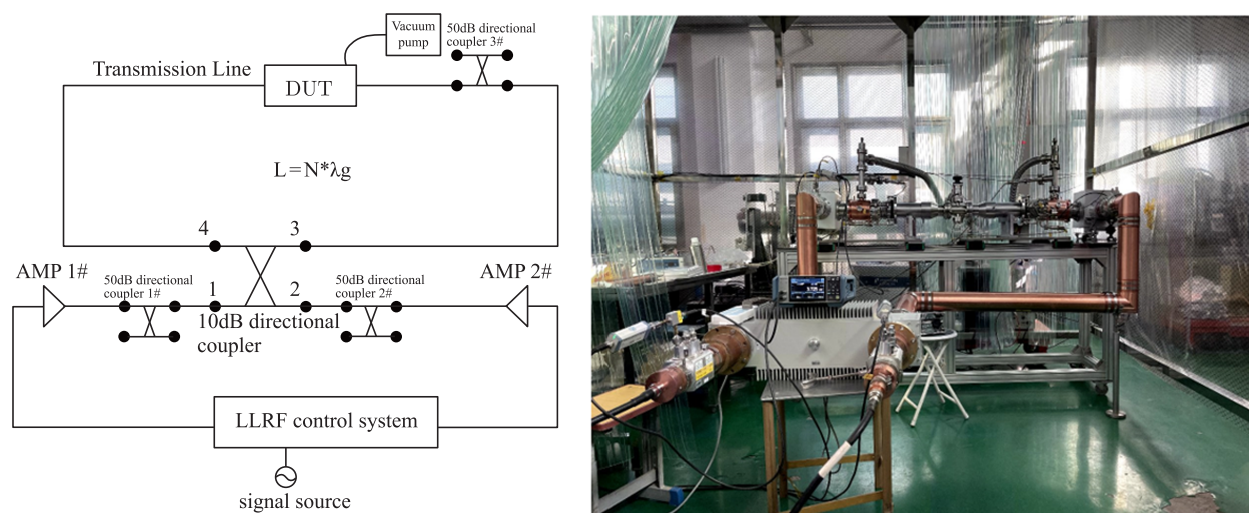


Fig. 1 (color online) The schematic view of the SW resonant ring.