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Measurement and matching of beam parameters extracted from CSNS/RCS

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In order to study the emittance evolution of the circulating beam in the fast cycling synchrotron (RCS) of the Chinese spallation neutron source (CSNS), the parameters of beam currents extracted at different times were measured. The measurement is based primarily on the wire scanners mounted in a high-energy transmission line (RTBT) for beam profile measurement, and the solution process uses two different methods. The measured emittance and TWISS parameters of the beam at different times provide a basis for the physical tuning of the RCS. The whole beam envelope in the RTBT is optimized based on the matching of the measurement results. The measured results are in agreement with the theoretical calculations.

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