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Design of the LLRF control system for MA cavity at CSNS RCS

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The China Spallation Neutron Source (CSNS) beam power was successfully reached 125 kW with a low beam loss in February 2022. In order to increase beam power, during the summer in 2022, we employ magnetic-alloy (MA) cavity in the rapid cycling synchrotron (RCS). It is a wideband cavity (Q=2) , allows the second harmonic rf (h= 4)operation, with the existing ferrite cavity to realize the dual-harmonic acceleration. The second harmonic (h=4) is used for the bunch shape control and alleviating the space charge effects. We design of the low level RF(LLRF) control system for MA cavity, in this paper, We describe the system design and implementation, and the preliminary test results.

Keyword

magnetic-alloy cavity, dual-harmonic acceleration, LLRF control system

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