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Design study of a $\beta=0.09$ high current superconducting half wave resonator at Peking University

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Beijing ISOL is an isotope separation on line (ISOL) type rare ion beam facility for both basic science and applications. The low beta high current superconducting half wave resonator (HWR) is being developed at Peking University for Beijing ISOL deuteron driver accelerator. A $\beta=0.09$ 162.5 MHz HWR cavity has been designed to accelerate several tens of mA deuteron beam. In this paper, the detailed electromagnetic design, multipacting simulation, mechanical design, beam dynamic simulation and high order mode analysis of the cavity will be given.

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