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【231】Reentrant Cavity Resonator for low Intensities Proton Beam Measurements

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In beam transport systems of a proton therapy machine, it is important to have an on-line measurement of the proton-beam intensity (nA). A non-interceptive beam intensity monitor has been developed for low-intensity beams for proton therapy machines without the hindrance of interceptive monitors. It works on the principle of a reentrant cavity resonator, matching its resonance frequency of 145.7 MHz to the second harmonic of the beam pulse repetition rate of 72.85 MHz. A prototype was built based on the ANSYS HFSS driven modal setup to optimize design parameters such as the position of inductive pickups. Characterization of the prototype is performed on a stand-alone test bench. Comparison of simulated and test bench scattering parameters provides a good agreement.

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