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Irradiation tests of a cavity core material and GaN devices in J-PARC Main Ring

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Magnetic alloy cavities have been used in many accelerators. We have irradiated small magnetic alloy rings in J-PARC to evaluate radiation effects on magnetic properties. Complex permeabilities and hysteresis curves were measured before and after the irradiation. No significant variation was observed by the total ionization dose of 18 kGy and neutron flux of 2.3×10^{14} n/cm². The doses were measured by RadMON ver.6 developed by CERN. The test will be continued to higher dose. High neutron irradiation caused radio activities and radioactive nuclei in the cores were identified in this work. We also tried to use RadMON with low gain mode. It suggested that RadMON can be used beyond 16 kGy. Gallium nitride devices were also tested for future applications in accelerator tunnels. They showed excellent radiation hardness.

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Footnotes

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Yes

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