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## Correcting asymmetry of closed-orbit distortion in J-PARC main ring by reducing current ripples of main magnet power supplies

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The main ring (MR) of the Japan proton accelerator research complex (J-PARC) delivers the high-intensity proton beams to the T2K long-baseline neutrino experiment. To observe charge-conjugation and parity-transformation violation in the lepton sector with high accuracy, the upgrade of the MR toward the beam power of 1.3 MW is mandatory. The magnet power supply system of MR was upgraded for this purpose during the long-term shutdown period in FY2021. However, the asymmetry of the closed-orbit distortion (COD) was observed after the upgrade. The cause of the asymmetry was attributed to the large ripples of the excitation currents for the bending magnets. The measures to reduce the ripples were applied to six identical power supplies for the bending magnets, and then the asymmetry was successfully corrected. This result suggests the tune region of the stable beam operation is expected to be improved since the effect of the non-structure resonance should be suppressed. This presentation reports the scheme of the ripple reduction for the excitation currents of the bending magnets and the measurement results of the COD in the MR.

### Footnotes

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**Primary author:** MORITA, Yuichi (High Energy Accelerator Research Organization)

**Co-authors:** TAN, Yulian (High Energy Accelerator Research Organization); YOSHINARI, Masaki (Nihon Advanced Technology Co., Ltd); YOSHII, Masahito (High Energy Accelerator Research Organization); HOTCHI, Hideaki (High Energy Accelerator Research Organization); IGARASHI, Susumu (High Energy Accelerator Research Organization); MIURA, Kazuki (High Energy Accelerator Research Organization); SAGAWA, Ryu (Universal Engineering); YASUI, Takaaki (High Energy Accelerator Research Organization); SHIMOGAWA, Tetsushi (High Energy

Accelerator Research Organization); ASAMI, Takashi (Japan Proton Accelerator Research Complex); SATO, Yoichi (Japan Proton Accelerator Research Complex)

**Presenter:** MORITA, Yuichi (High Energy Accelerator Research Organization)

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