Contribution ID: **1614** Contribution code: **THPB045** Type: **Poster Presentation**

Permanent magnet-based dipole-quadrupole magnet for SPring-8-II

Thursday 5 June 2025 15:30 (2 hours)

In recent years, permanent magnet (PM) based multi-pole magnets have become an increasing concern as a replacement for conventional electro-magnets for light sources. The PMs are possible to save both energy and costs for operating and construction the facilities due to the absence of a power supply and cooling system. They have other advantages such as less space without magnetic coils and fewer failures than the conventional electro-magnets. PMs have specific issues, such as the adjustability of the magnetic field, demagnetization, and temperature dependence. Solutions to these issues were already confirmed with dipole structures for SPring-8-II, a major upgrade project of SPring-8 to the fourth generation. We have extended the knowledge and schemes to a dipole-quadrupole combined-function magnet (DQM) that comes in a quadrupole structure. The DQM is readily splittable into an upper and lower half for installation of a vacuum chamber. The reproducibility of the field gradient with half-splitting was less than 0.1%, which is within the required value. We report on the design and trial-manufacture of the PM based DQM.

Footnotes

Paper preparation format

Word

Region represented

Asia

Funding Agency

Author: MATSUBARA, Shin-ichi (Japan Synchrotron Radiation Research Institute)

Co-authors: YAMAGUCHI, Hiroshi (Japan Synchrotron Radiation Research Institute); FUKAMI, Kenji (RIKEN SPring-8 Center); TANIUCHI, Tsutomu (Japan Synchrotron Radiation Research Institute); WATANABE, Takahiro (Japan Synchrotron Radiation Research Institute)

Presenter: MATSUBARA, Shin-ichi (Japan Synchrotron Radiation Research Institute)

Session Classification: Thursday Poster Session

Track Classification: MC7: Accelerator Technology and Sustainability: MC7.T34 Permanent Magnets