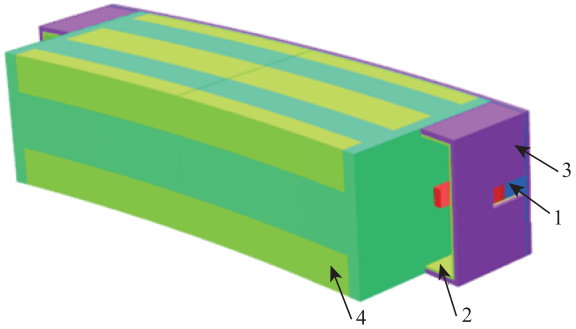

Fig. 1 (color online) The model of septum magnet with shielding.

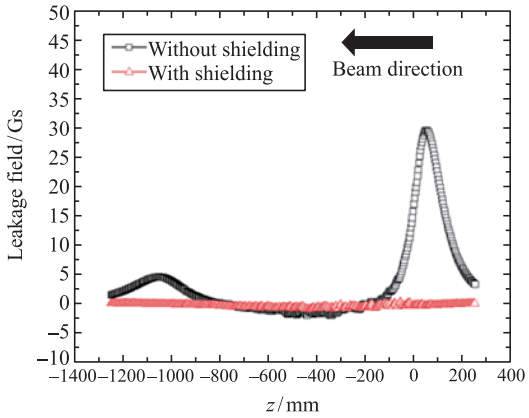

Fig. 2 (color online) Comparison of leakage field values with or without shielding.

References

[1] M. Yoshimoto, Designs of Septum Magnet at 3 GeV RCS in J-PARC, (2006).
[2] X. Zhang, S. Han, W. Yang, et al., High Power Laser and Particle Beams, (2015)27.

7 - 7 R&D Progress of HIAF-BRing Dipole Magnet Power Supply*

Wu Fengjun, Wang Xiaojun, Yan Hongbin, Tan Yulian, Li Yuan, Li Yuhang and Gao Daqing

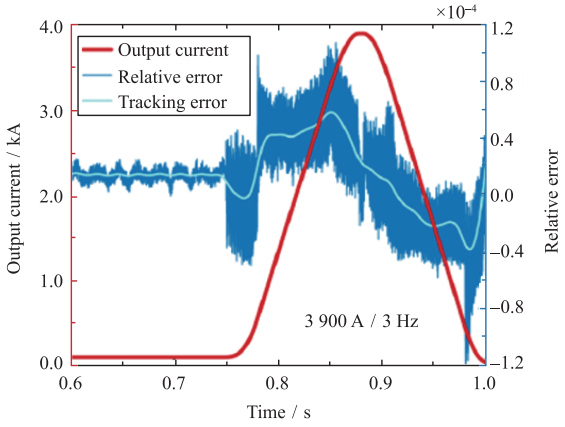

Fig. 1 (color online) The output result of BRing diploe power supply.

The Booster Ring (BRing) is the core of the acceleration unit to obtain high-current, high-energy and high-quality heavy ion beam in the High Intensity heavy ion Accelerator Facility (HIAF) [1]. To reduce the space charge effect and the dynamic vacuum effect, the fast-ramping rate of the dipole magnet power supply is up to 38 000 A/s, which poses great challenges to the power supply system. Therefore, variable forward excitation, full energy storage, and full switching technology are studied and used. In October 2022, this power supply prototype has been finished and completed the factory acceptance test. The production and tunning of the first whole set of the power supply system is currently underway. The onsite assembly and commissioning works are also in process. Figure 1 shows the one of acceptance test results of this power supply. The output error can be $\pm$ 1.2 $\times$ 10^{-4}, which meets the design requirement. Figure 2 shows the physical image of the dipole power supply. They consist of multiple modules, including high-voltage sources and low-voltage sources, and some detail modules such as capacitor banks modules, AFE (Active Front End) modules, H bridge modules and so on.

Fig. 2 (color online) The image of one set of the dipole magnet power supply system.

Reference

[1] J. C. Yang, Nucl. Instrum. Meth. B, 317(2013)263.

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7 - 8 R&D Progress of HIAF Kicker Power Supply

Gao Jie and Gao Daqing

Kicker power supply is one of the key components of the high-intensity heavy ion accelerator HIAF. It is also one of the main components to achieve fast extraction of the beam from BRing and fast injection of the beam to SRing. Table 1 shows the technical indicators of the BRing Kicker power supply and SRing Kicker power supply. It adopts the scheme of Blumlein-PFN and thyratron solution. The kicker power prototype has been fully completed and accepted. The right panel of Fig. 1 shows the final test result of the BRing Kicker power supply. It fully meets the design requirement. The left panel of Fig. 1 shows the physical picture of it. The SRing- Kicker power supply prototype uses the pulse forming line and thyristor scheme method. Figure 2 shows the main scheme diagram of this method. And now this scheme and the key device design have been finished, which proves that it is feasible. For the moment, the mass production bidding work is currently underway. In addition, a review of the technical and craft design for the Kicker power supply used onsite has been finished, which includes material purchasing, machine installation, and tuning.

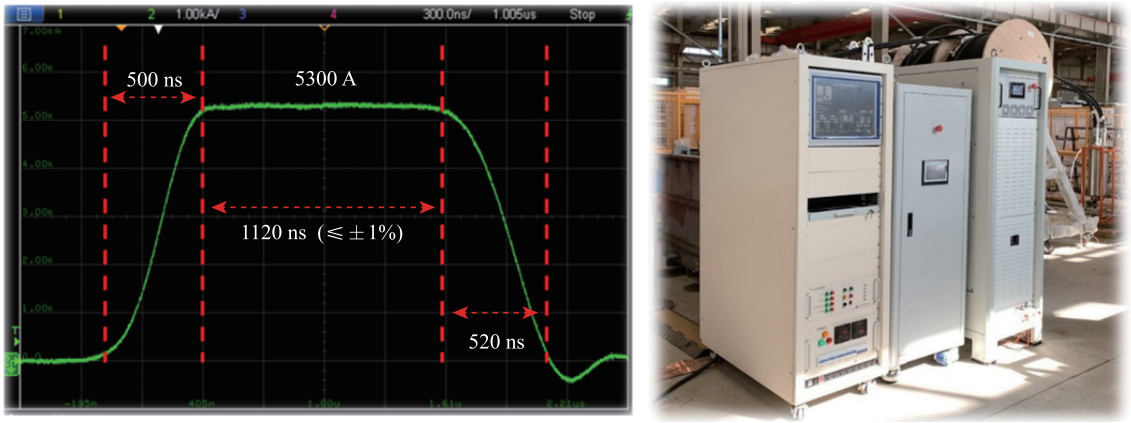

Fig. 1 (color online) The left panel is the final test result of the BRing Kicker power supply. The right panel is the picture of the BRing Kicker power supply.

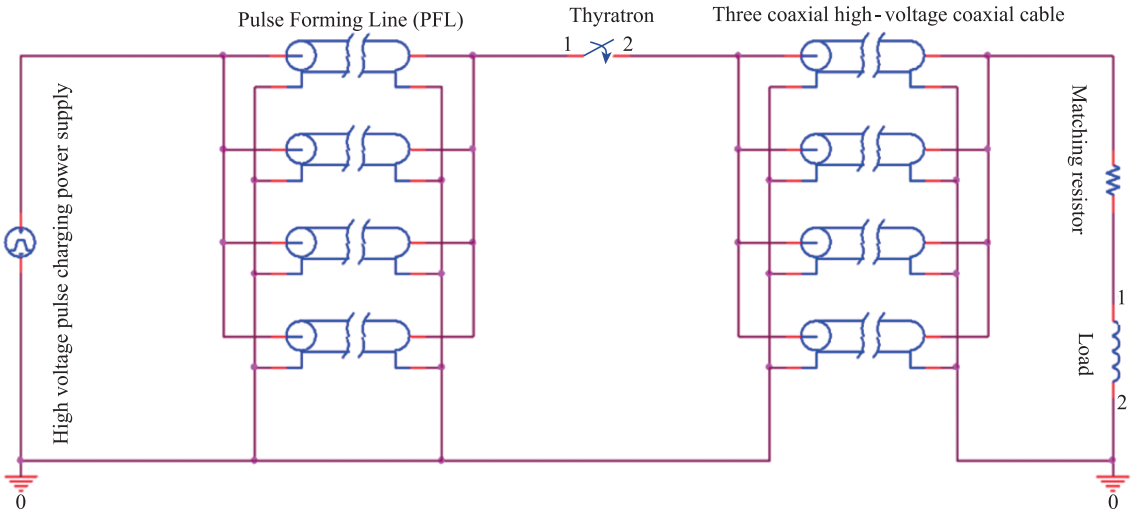

Fig. 2 (color online) The main scheme diagram of the pulse forming line and thyristor scheme method of the SRing Kicker power supply.