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Design and test of a rotating magnetic field measurement system based on PCB technique

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Rotating coil magnetic field measurement system is an essential component to achieve the multipole harmonic fields measurement in accelerator quadrupole magnets. The fundamental requirement for the coils are accuracy, easy fabrication and low-cost, so that the coil parameters can be customized to the magnet requiring test. This paper introduces the application of PCB technique on rotating magnetic field measurement system. After an introduction on the design considerations of the coil parameters and bucking method, we describe the manufacture details of the coil, required by HUST-PTF quadrupoles. Compared to the traditional hand winding coil, the weight and cost of the complete coil is drastically reduced. Finally, the measurement result of a quadrupole is present, which demonstrates high repeatability.

Primary author: Dr HAN, Wenjie (Huazhong University of Science and Technology)

Co-authors: Mr CHEN, Geng (State Key Laboratory of Advanced Electromagnetic Engineering and Technology); QIN, Bin (Huazhong University of Science and Technology); LIU, Xu (Huazhong University of Science and Technology); CHEN, Qushan (Huazhong University of Science and Technology)

Presenter: Dr HAN, Wenjie (Huazhong University of Science and Technology)

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