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Optimized configurations for enhancing the interaction capacity between permanent magnet and superconductor coil

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Our research has shown that an energy conversion/storage device composed of a permanent magnet and a superconductor coil has superior performance. In order to improve the conversion efficiency and energy storage capacity of this device. An effective method to enhance the interaction behavior between a permanent magnet and a closed superconductor coil is proposed in this paper. The functions that determine the induced current in the superconductor coil and the interaction force between the coil and the external magnetic field are derived in principle. Three experiments are composed to verify the proposed method. The results indicate that the calculation formulas and the enhancement method proposed in this paper have guiding significance for the study of the interaction between permanent magnets and closed superconducting coils. In addition, this method is of great significance to our study of the energy conversion/storage device.

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