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Wed-Af-Po3.24-04 [98]: Design and research of a REBCO plate-stacked coil

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High-temperature superconducting magnet technology are developing fast, especially using REBCO tapes. This paper present a new design of a HTS coil. The coil is made of stacked REBCO plates and operates with power supply, which works like a conventional resistive coil. The structure design and construction details was then described herein. The advantage of this design is its low inductance which make it excited fast. Finite element method was used to analyze the stress distribution and thermal stability of the coil. We fabricated a model coil by this design and test its performance and feasibility at 77 K. The critical current Ic of the REBCO tapes we used to fabricated the model was measured at 77 K, and was compared to the critical current of the model coil. We listed our future work plan to improve our design. The design has potential application in future LN2 magnets. It is also afford a new idea to make high field magnets cooled by 4.5 K supercritical helium flow or conduction cooled by cryocooler.

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