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Mon-Mo-Po1.09-02 [98]: Magnetic levitation using stacks of commercial superconducting tapes

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Abstract-Stacks of commercial high temperature superconducting (HTS) tape can be magnetized to act as strong magnets for magnetic levitation. Based on our laboratory's high temperature superconducting magnetic levitation platform, in this paper, commercial superconducting tapes are used for stacking to replace the superconducting bulks. We stacked new model round bulk with a diameter of 24-mm and square bulk with a side length of 24-mm, and we have performed theoretical and experimental studies with these stacks. The samples were magnetized using a Nd-Fe-B magnet in a temperature range of 77k to 20k. The axial levitation force was measured between field cooled HTS stacks and permanent magnet in our laboratory device. We also tested the magnetic levitation force of bulk samples of the similar shapes and compared it to stacks.

Index Terms-HTS tape, bulk superconductors, stack of tapes, trapped field, magnetic bearings, magnetic levitation

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