

**Development of a Superconducting Magnetic Bearing Able to support Large Loads  
in a Flywheel Energy Storage System for its Application to Railways**

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The flywheel energy storage system (FESS) using the high temperature superconducting magnetic bearing (SMB) has been demonstrated at Komekurayama photovoltaic power plant located in Yamanashi Prefecture. Further increase of the storage capacity is required in order for the FESS to be applied to the railways as the system that prevents cancellation of regenerative braking. Therefore, the levitation force test up to 158kN and the creep characteristics test of the levitation force were carried out in order to verify the margin for the levitation force of the SMB. Furthermore, in order to evaluate long-term reliability and durability of the levitation and rotation characteristics of the SMB against repeated change of the rotation speed, a new SMB test apparatus capable of simultaneously experimenting both the levitating state and the rotating one of the SMB is being developed.