

Key Technology of the Superconducting Flywheel Energy Storage Demonstration Machine

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The superconducting flywheel energy storage systems (FESS) can stabilize the fluctuation of the output of the solar photovoltaic power generation system. The FESS has been developed as a joint project of five enterprises subsidized by the New Energy and Industrial Technology Development Organization. Four key technology of the FESS are the magnetic fluid seal (MFS) technology for vacuum seal by means of the multi-material shaft, the active magnetic bearing (AMB) technology for non-contact levitated support, the dynamic break resistor (DBR) technology for allowing storage energy to be consumed as heat energy, the touch down bearing (TDB) technology for the safety device in case of the superconducting magnetic bearing's failure. In this paper, the principle and the feature of those technologies are described, and the validity of the design is also described.