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## **Wed-Mo-Po3.13-11 [119]: Design of a High temperature superconducting linear synchronous motor for pulse power application**

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Linear synchronous motor is expected to be widely used in pulse power application, such as electromagnetic launch. A High Temperature Superconducting linear synchronous motor (HTS-LSM) for pulse power application is developed in this paper. A HTS winding is used as the moving coil, the stator coil is wound with copper winding. The superconducting winding has been excitation to flow DC current before a launch, which makes the current flows in the HTS winding in a closed-loop and remain constant DC during the launching. Thanks to both the zero resistance characteristics of superconducting and short-time emission characteristics of pulse power applications, a synchronous launch is achieved without a DC excitation applied on the moving coil. At the end of a launch process, the limited launch velocity is expected to reach the maximum point with the margin of the critical current of the HTS winding reducing to near zero. A small HTS-LSM prototype is designed in this paper. Both the synchronous launch mechanism of HTS-LSM and the electromagnetic characteristics of the superconducting winding are researched. The limit launch characteristic of the superconducting winding is also studied. Results show that the HTS-LSM has a higher utilization ratio of superconducting wires and a good emission efficiency.

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