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# Stability of a metal insulated 2G HTS coil under the external ac field

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One of the biggest weaknesses of superconducting coils is that the coil burns out when quick action is not taken at the moment of quench. It is known that the no insulation (NI) technology of the high temperature superconducting (HTS) coil almost solved the problem of burning the coil by this quench. In HTS coil applications, the larger coil sizes and higher generated magnetic field strengths require the coil to be mechanically stronger. In addition, metal insulation (MI) technology, one of the NI technologies, is proposed to improve the slow current ramp rate of the NI HTS coil. The MI technology of HTS coils has been applied to quadrupole magnets for heavy ion accelerators and HTS induction heating devices. However, the MI coil technology has not yet been applied to propulsion motors in aircraft and ships. The MI HTS field winding is expected to exhibit the same response as the isolated HTS field winding in normal operation. However, in real operation the MI HTS field winding will inevitably experience sudden forces such as acceleration, load fluctuations, etc. This will definitely affect the MI HTS coil. Therefore, it is necessary to check whether the MI HTS coil quench occurs due to the fluctuating external magnetic field and how the generated magnetic field changes.
In this study, an armature coil of a three-phase linear motor was fabricated and a MI HTS model coil was installed on it. By applying alternating current of several frequencies to the armature using a commercial inverter, we will investigate the stability of MI HTS coil during start, maintenance, and stop. The result will be reported.
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