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## Design and Analysis of an Energy-Extraction System for High Current HTS Magnets

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High temperature superconducting magnets (HTS) suffer from slow quench propagation, have high thermal margin, and consequently require external energy extraction for quench protection. This is especially the case with such accelerator magnets where most of the magnet volume operates far away from its critical surface. Quench heaters and CLIQ, as the most promising quench protection systems (QPS) for low temperature superconductor (LTS) based accelerator magnets, are not effective for HTS magnets and new solutions are needed. Recently two new concepts, ICED and E3SPreSSO, for HTS magnet protection have been presented in the scope of European project EuCARD-2. The principle of ICED is the same as secondary winding for passive energy extraction and E3SPreSSO utilises a series connected bifilar HTS or LTS coil. In this work we present a methodology to design QPS based on ICED and E3SPreSSO for HTS magnets. Then we utilise this methodology to design and analyse the suitability of such QPS for a 20 T HTS accelerator dipole.

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