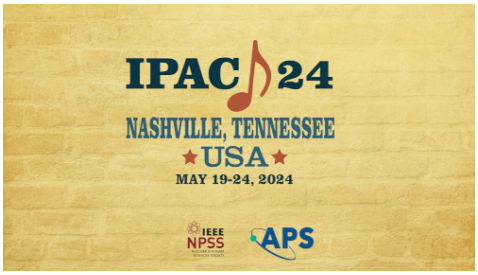

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Solder cryogenic fatigue of the RHIC 12x150A current leads and mitigation for future operation

Tuesday, 21 May 2024 16:00 (2 hours)

A recent failure of the RHIC powering system has led to the discovery of cracked solder joint on the 12x150A current leads used to trim the superconducting magnet current in the interaction regions. These cracked joints are thought to have led to an electrical breakdown, first within the joint, and eventually across adjacent conductors of the same lead. An experiment has been set up to study the behavior of Sn96Ag4 solder joints under cryogenic temperature cycling in relevant conditions. Mitigation measures to minimize further crack propagation have been studied for the next RHIC run and will be discussed. This paper aims to describe our understanding of the solder cryogenic cracking issue encountered and present the mitigation measures for future RHIC operation.

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