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Development of Superconducting Joint Characterization Test Facility at IUAC, New Delhi

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Content :

Superconducting magnets used for NMR/MRI applications are operated in persistent mode, which means they are initially charged to the required operating current and then magnet terminals are shorted using persistent current switch. This will provide a non-decaying current which leads to a very stable magnetic field. The temporal stability of MRI magnet needs to be better than 0.1 ppm/hr. The temporal stability of the magnet field would depend on the resistance of the joints between the multi-filamentary NbTi terminals of the MRI magnet. The desired temporal stability can only be achieved by superconducting joints of resistance ~10E-12 to 10E-13 Ω. A superconducting magnet based test rig for characterization of superconducting joint is under development at IUAC. This paper briefly describes the complete set up with details of test methodology of superconducting joint at 4.2 K.

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