

Elimination of Training in Nb₃Sn and NbTi Superconducting Magnets

Sunday 25 August 2024 16:00 (2 hours)

By using TELENE® resin as superconducting magnet impregnation material, training and magnet retraining after a thermal cycle were nearly eliminated in Nb₃Sn undulators. This allows reducing operation margins in light sources, and increasing the on-axis magnetic field, thereby expanding energy range and brightness intensity. TELENE is Co-60 gamma radiation resistant up to 7-8 MGy, and therefore already applicable to impregnate planar, helical and universal devices operating in lower radiation environments than high energy colliders. Radiation resistance further increases in TELENE when mixed with high-Cp and/or high-thermal conductivity powders. We herein show that when combined with the ductility and toughness properties of TELENE, these resins display superior training performance with respect to CTD-101K in a variety of Nb₃Sn magnet models. In addition, TELENE was proven to eliminate training also in NbTi accelerator magnets. Therefore, TELENE can be used in the Magnetic Resonance Imaging (MRI) industry to solve the NbTi solenoids training problem. The transfer of technology in using TELENE resin to the MRI industry will have transformative societal impact on global health.

Footnotes

Funding Agency

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