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Magnetic circuit design and consideration for HTSW using 12mm HTS tape

Wednesday 4 June 2025 16:00 (2 hours)

The National Synchrotron Radiation Research Center (NSRRC) is focused on the application of 2G high-temperature superconducting tape (2G-HTS) for the insertion device in the Taiwan Photon Source (TPS) synchrotron ring. A preliminary design for a 2G-HTS wiggler (HTSW) is being developed, with considerations for sharing the SRF straight-section to make efficient use of space. The target field strength of the HTSW is 3.5 T, chosen to avoid increasing electron beam emittance. The HTSW is also designed to operate using a cryogen-free cryostat with a cryocooler to reduce liquid helium consumption. Safety margins for the current density applied to the HTS tape have been considered to prevent quenching during operation. Various parameters of the HTSW have been optimized and discussed to meet operational requirements, and a set of suitable parameters for HTSW in TPS is presented in this letter.

Footnotes

Paper preparation format

Word

Region represented

Asia

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