Contribution ID: **65** Contribution code: **WEP45** Type: **Contributed Poster**

Magnetic Field Investigation in a Compact Superconducting Undulator with HTS Tape

Wednesday 24 August 2022 17:10 (20 minutes)

The superconducting undulator (SCU) based on the second-generation high-temperature superconducting (HTS) tapes is a promising application for building tabletop free-electron lasers (FELs). The short period < 10 mm undulators with a narrow magnetic gap < 4 mm are especially relevant. The advantage of the HTS tape is that it shows both high critical current density and high critical magnetic field. Each tape has 50 µm thickness and 12 mm width and is further scribed by a laser to achieve a meander structure, hence, providing the desired magnetic field pattern.

Thus, a new approach to a superconducting undulator has been presented in the past and is further developed at KIT: each coil is wound with a single 15 m structured HTS tape. As a result, 30 layers of scribed sections lay above each other, and therefore, provide the required magnetic field. The results of the magnetic field measurements together with the results of the numerical investigation will be presented and discussed.

I have read and accept the Privacy Policy Statement

Yes

Primary authors: ASTAPOVYCH, Daria (Karlsruhe Institute of Technology); GLAMANN, Nicole (Karlsruhe Institute of Technology); GRAU, Andreas (Karlsruhe Institute of Technology); KRASCH, Bennet (Karlsruhe Institute of Technology); SAEZ DE JAUREGUI, David (Karlsruhe Institute of Technology)

Presenters: ASTAPOVYCH, Daria (Karlsruhe Institute of Technology); GLAMANN, Nicole (Karlsruhe Institute of Technology); GRAU, Andreas (Karlsruhe Institute of Technology); KRASCH, Bennet (Karlsruhe Institute of Technology); SAEZ DE JAUREGUI, David (Karlsruhe Institute of Technology)

Session Classification: Wednesday posters

Track Classification: Photon beamline instrumentation & undulators