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HTS REBaCuO coated conductors for the FCC-hh beam screen: Performance under photon irradiation at the ALBA Synchrotron Light Source

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High-Temperature Superconductor (HTS) REBaCuO coated conductors (REBCO-CC) are being considered as possible coating materials for the beam screen of the FCC vacuum chamber replacing Cu which might not present sufficiently low beam impedance. Understanding the behaviour of the tapes under the influence of RF fields, magnetic fields and synchrotron radiation is fundamental to achieve a sound decision.

Samples from different manufacturers have been studied at the ALBA Synchrotron Light Source which produces a photon flux spectrum comparable to that expected at the FCC-hh with protons at 100 TeV and a beam current of the order of 0.5 A.

A cryo-finger which works from 20K to room temperature has been installed in the ALBA SR along the hard X-ray pinhole. The setup allows the measurements of the resistance as a function of temperature while the samples are irradiated with high energy photons. The first results obtained on the tapes, as a function of the dose received, will be presented, as well as the plans for the future to expand the measuring capabilities to include surface impedance determination.

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