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## **Synthesis and study of Tl-1223 Superconducting Thin Films for the Future Circular Collider (FCC-hh) Beam Screen**

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The properties of thallium based superconductors are under exploration for the potential coating of the beam screen of the future circular collider (FCC). The FCC's (100 km in circumference) study revolves around achieving 100 T-eV center-of-mass energy through the collision of beams (steered by 16 T magnetic field produced by superconducting magnets). One of the most important tasks is beam stability, and a beam screen (40-60 K) with a high impedance might give rise to beam instabilities. Theoretical calculations show that the surface resistance of copper at the given temperature range might not be low enough for the anticipated performances. As a consequence, high-temperature superconductors have been proposed as potential low impedance materials that face the beam during operation to replace bare copper, which is the current state of technology in the LHC at CERN.

To contribute to this research, we process and analyze thallium based superconducting samples. We will show the improvement made in Tl-1223 superconductors, their characterization, suitability for the demanding conditions, vacuum compatibility, and the secondary electron emission reduction to a significantly low level after the amorphous carbon coating.

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**Author:** SABA, Aisha

**Presenter:** SABA, Aisha

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