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## **Microstructural characterization of advanced superconducting materials for different components of the CERN Future Circular Collider (FCC-hh)**

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The microstructural characterization represents an essential aspect for helping the enhancement of the material superconducting properties. Within the huge CERN project related to the realization of the FCC-hh, we focused on the microstructural analysis of superconducting materials envisioned as suitable candidates for some of its fundamental components:  $\text{Nb}_3\text{Sn}$  for the bending magnets,  $\text{MgB}_2$  for the superconducting links and  $\text{Ti-1223}$  for the beam screen. For each of these materials, produced by different manufacturers, we received several prototype samples, which differ from each other due to some specific changes brought to the manufacturing process. A key point of this work is to understand how the parameters involved in such processes influence the material microstructural features, in order to give a contribution in terms of producing wires and films with optimized superconducting performances. For this purpose, different electron microscopy techniques were employed with both Scanning Electron Microscopy (SEM) and Transmission Electron Microscopy (TEM).

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