

Microstructure-Property Correlations in Superconducting Wires

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Abstract – Because of their complexity on length scales from atomic disorder to macroscopic cables, the development of the high-performance superconductors relies on accurate characterization of their micro- and macrostructures. Furthermore, the performance of superconductors is often limited by structural and chemical inhomogeneities, both locally and over long lengths, that provide particular challenges for techniques that often sample only small volumes of material. In this talk, we demonstrate how key developments in our understanding of superconductors wire made possible by combining quantitative microscopic and micro-chemical techniques with detailed characterizations of superconducting properties. As we push our current generation of superconductors towards its limits, we look at the new innovations in microscopy required to understand those limitations and provide us with the information we need to make the next generation of superconductor applications a reality.

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