

Progress towards iron-based coated conductors

Laura PIPERNO - *ENEA Frascati Research Centre*

In view of the exploitation of nuclear fusion as a sustainable energy source, the late efforts of the scientific community are aimed at increasing the magnetic field strength of magnets and the operating temperature of a tokamak device. In this view, great expectations rely on iron-based superconductors (IBSCs). The high magnetic critical fields and critical current densities (J_c), coupled to small anisotropy and large critical grain boundary angle for J_c , make the IBSCs ideal for the fabrication of coated-conductors (CCs) with a simplified architecture. Moreover, in view of large-scale applications, the integration of low-cost, chemical methodologies in the preparation process of IBSC-based coated conductors could be a game changer. In this work, we explore the possibility of employing electrochemistry in the production of superconducting FeSe films, starting from the study of the precursor solution to the detailed characterization of the deposits. For this purpose, a variety of techniques will be used, from cyclic voltammetry of the solution, to X-ray diffraction, scanning electron microscopy and DC measurements for the deposits.