Abstract of Presentation

FeAs based superconducting thin films

Abstract :

The IFW Dresden works intensively on the preparation and characterization of superconducting FeAs based thin films. Pulsed Laser Deposition is used for preparation of Co-doped Ba122 and REFeAs(O,F) thin films. Whereas in-situ epitaxial film growth was demonstrated for Co-doped Ba122 thin films [1], polycrystalline and epitaxial LaFeAs(O,F) films with superconducting transition temperatures >20K were obtained by a 2-step preparation process [2,3]. The main direction of interest is towards understanding both the intrinsic superconducting parameters like $H_{c2}(T)$ [4] and extrinsic properties like critical current density [5,6] and pinning in combination with microstructural investigations. For these studies extensive microstructural analysis tools like HRTEM (Cs-corrected Titan microscope), EBSD, x-ray texture and standard transport measurements as well as high field measurements up to 60T are available.

Main recent results include :

- Successful preparation and characterization of polycrystalline and epitaxial superconducting LaFeAs(O,F) thin films [2,3]
- Demonstration of a strong strain influence on T_C of Co-doped 122 thin films [1]
- Investigation of high upper critical fields and weak link behaviour in La-1111 thin films [4]
- Blatter scaling of critical current densities in epitaxial LaFeAs(O,F) and Co-doped 122 thin films [5,6]:
- Realization of atomically sharp interfaces in Fe/Ba122 bilayers [7]

References :

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