Abstract of Presentation

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Presentation Title:

Challenge of Nanotechnology Applications to Votex Pinning in High-Tc Superconductors

Abstract :

The high-T_c superconducting technology will be related closely to “the green technologies” together with a solar cell and a wind power generation, etc. in the future to solve the energy environmental problems. However, the dramatic improvement of the I_c characteristic is strongly required to produce an efficient, low-cost high-T_c superconducting tapes. The vortex pinning technology is holding the key for this purpose. The vortices are 2-3 nm in diameter and run through the superconductor, and the average distance among them is about 10-20 nm in high magnetic fields. To obtain the high-I_c, strong pinning centers should be introduced over the total length of the tape for preventing vortices from moving by Lorentz force. Therefore, the vortex pinning control by nanotechnology is very effective and the research of this field is being much activated now. Here, the state-of-the-art of the pinning technology, which is called “Artificial Pinning Centers (APCs)”, is introduced.