Critical Current Density in $Ag/YBa_2Cu_3O_x$ and $PrBa_2Cu_3O_y/YBa_2Cu_3O_x$ Multilayers

V. S. Dang[1], P. Mikheenko[1], A. Sarkar[1], J. S. Abell[1] and A. Crisan[1,2]

[1]School of Metallurgy and Materials, University of Birmingham,
Birmingham B15- 2TT, United Kingdom.
[2]National Institute of Materials Physics, Bucharest 077125, Romania

*Corresponding Author e-mail: v.dang@bham.ac.uk

Abstract - One of successful methods of introducing artificial pinning centres in superconducting films is by alternating layers of superconducting material and incomplete layers (planar distributions of nanodots) of other materials (quasi-superlattice or quasi-multilayer approach). Most of the work on artificial pinning centres has been done on thin $YBa_2Cu_3O_x$ (YBCO) films and a large variety of quasi-multilayer materials have been explored. It is still difficult to justify the choice of a quasi-multilayer material for particular superconducting applications. One of the properties to be taken into account is compatibility of the crystal lattice of YBCO and the quasi-superlattice material. Here we compare the superconducting behaviour of two very different quasi-multilayers: one with very similar crystal lattices of nanodots and YBCO: $PrBa_2Cu_3O_y$ (PBCO)/YBCO, and another one with very different, Ag/YBCO. We found that the difference between crystal lattices strongly affects superconducting properties of quasi-multilayers and leads to different types of pinning in the films.

IEEE/CSC & ESAS EUROPEAN SUPERCONDUCTIVITY NEWS FORUM (ESNF), No. 11, January 2010
Published in *Journal of Physics Conf. Series* (*SuST*) 234, 012010 (2010)