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Vortex pinning landscape in MOD-TFA YBCO nanostructured films J. GUTIERREZ, T. PUIG, A. POMAR, X. OBRADORS, ICMAB-CSIC — A methodology of general validity to study vortex pinning in YBCO based on J_c transport measurements is described. It permits to identify, separate and quantify three basic vortex pinning contributions associated to anisotropic-strong, isotropic-strong and isotropic-weak pinning centers. Thereof, the corresponding vortex pinning phase diagrams are built up. This methodology is applied to the new solution-derived YBCO nanostructured films, including controlled interfacial pinning by the growth of nanostructured templates by means of self-assembled processes [1] and YBCO-BaZrO₃ nanocomposites prepared by modified solution precursors. The application of the methodology and comparison with a standard solution-derived YBCO film [2], enables us to identify the nature and the effect of the additional pinning centers induced. The nanostructured templates films show c-axis pinning strongly increased, controlling most of the pinning phase diagram. On the other hand, the nanocomposites have achieved so far, the highest pinning properties in HTc-superconductors [3], being the isotropic-strong defects contribution the origin of their unique properties. [1] M. Gibert et al, Adv. Mat. vol 19, p. 3937 (2007) [2] Puig.T et al, SuST EUCAS 2007 (to be published) [3] J. Gutierrez et al, Nat. Mat. vol. 6, p. 367 (2007) * Work supported by HIPERCHEM, NANOARTIS and MAT2005-02047

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