Abstract Submitted
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**Critical currents in superconducting films with array of magnetic and non-magnetic dots: Interstitial vs. trapped vortices**[1] JAVIER DEL VALLE, ALICIA GOMEZ, ELVIRA GONZALEZ, JOSE VICENT, Universidad Complutense Madrid — Arrays of magnetic Py dots and non-magnetic Cu dots have been embedded in Nb superconducting films by electron beam lithography and sputtering techniques. (I,V) curves have been measured in both systems. The critical current values extracted from the (I,V) curves show periodic maxima which are induced by the well-known matching effect between the vortex lattice and the array of nanodefects. The Nb film with non-magnetic Cu array shows an unexpected larger number of maxima than the Nb film with the magnetic Py array. Furthermore, comparison between critical currents in both samples shows a striking result, a crossover is measured increasing the applied magnetic fields. At low applied magnetic fields critical current values are higher in the magnetic (Py) dot sample than in the non-magnetic (Cu) dot sample, but increasing the applied field the opposite occurs, i. e. the critical current in Nb film with Cu dots is higher than the critical current in Nb film with Py dots. These data are analyzed taking into account the different behavior between interstitial vortices and vortices trapped in the pinning potential wells which are generated by the different arrays.

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