



11th International Conference
on Advanced Materials

Rio de Janeiro Brazil
September 20 - 25

ICAM2009

Dynamics of superconducting vortices in Nb/Co superlattices

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The Nb/Co superlattice systems present a very interesting testground to study the interaction between the superconductor and the ferromagnet in a hybrid system. Recently, [1], we have shown that the magnetic response of the superlattice exhibits a complex behavior which can be understood, in terms of a simple model, as an interplay between the superconductor magnetization temperature dependence, and the ferromagnet magnetization time dependence. We have also shown there, that the magnetic state of the *Co* layers is modified by the *Nb* superconducting response, implying that the problem of a superconductor/ferromagnetic heterogeneous sample has to be solved in a self-consistent manner. In this work we will focus on the behavior of the superconducting vortex system. Through ac-susceptibility measurements in the superconducting state, we will explore the characteristics of the vortex dynamics. We will show that the ferromagnet layers impose boundary conditions on the vortex lattice when the magnetic field is applied in the parallel to the layers direction.

References

- [1] C. Monton, F. de la Cruz and J. Guimpel, Phys. Rev. B **77**, 104521 (2008).