



11<sup>th</sup> International Conference  
on Advanced Materials

Rio de Janeiro Brazil  
September 20 - 25

## Superconducting/Ferromagnetic Heterostructures Study

*Miguel A. Zorro Millán<sup>(1)\*</sup>, Clécio C. de Souza Silva<sup>(2)</sup>*

- (1) Universidade Federal de Pernambuco, Pós-Graduação em Ciência de Materiais, Recife-PE, Brasil.
- (2) Universidade Federal de Pernambuco, Departamento de Física, Recife-PE, Brasil.

**Abstract** – Maximum 100 words.

It has been systematically shown, in the past decade, that artificially created superconductor-ferromagnetic hybrids are able to use ferromagnetism to enhance some superconducting properties. Heterostructures of ferromagnetic and superconducting components offer the possibility to investigate the coexistence phenomena. In the present work, we solve numerically the time-dependent Ginzburg-Landau equations to analyze the interplay between superconductivity and magnetism in a system comprising a ferromagnetic disk array inside a superconducting film. Our study is carried out as a function of temperature, magnetic moment and geometric parameters of the disk array. We investigated in detail the superconducting transition, Little-Parks oscillations, and pinning phenomena.