

**Seminario de análisis matemático y aplicaciones
Analisi matematikoa eta aplikazioak mintegia**

**On the atomic orbital magnetism: A
rigorous derivation of the Larmor and
Van Vleck contributions**

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ABSTRACT: The purpose of this talk is to rigorously review the orbital magnetism of core electrons in 3-dimensional crystalline ordered solids and in the zero-temperature regime. Our model is a non-interacting Fermi gas subjected to an external periodic potential which models the crystalline field within the tight-binding approximation (i.e. when the distance between two consecutive ions is large). For a fixed number of particles in the Wigner-Seitz cell and in the zero-temperature limit, we derive an asymptotic expansion for the bulk zero-field orbital susceptibility. We prove that the leading term is the superposition of the Larmor diamagnetic contribution, generated by the quadratic part of the Zeeman Hamiltonian, together with the 'complete' orbital Van Vleck paramagnetism contribution, generated by the linear part of the Zeeman Hamiltonian, and related to field-induced electronic transitions.

LUGAR / LEKUA:

**Sala de seminarios de la sección de matemáticas
Matematika ataleko mintegi gela**

DÍA Y HORA / EGUNA ETA ORDUA:

23/10/2014, 12:00