

ON THE ZERO-FIELD ORBITAL MAGNETIC SUSCEPTIBILITY  
OF BLOCH ELECTRONS

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We present a rigorous mathematical treatment of the zero-field orbital magnetic susceptibility of non-interacting Bloch electrons in crystalline ordered solids at zero-temperature and fixed density of particles. In the metallic case, we notably investigate the validity of the Landau-Peierls approximation in the low density regime. The semiconducting situation also is treated; here we mainly focus on the particular case of gapped graphene-like solids.