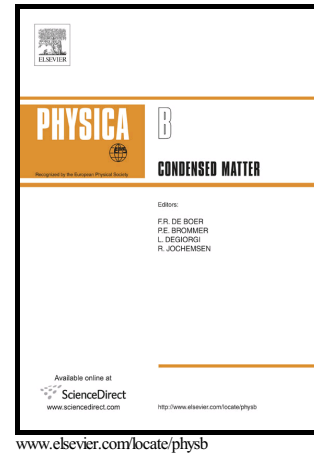


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Pauli magnetic susceptibility of bilayer graphene and hexagonal boron-nitride

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Abstract

We study the contribution of s and p orbitals on the Pauli magnetic susceptibility (PMS) and density of state (DOS) of the following three structures (1) bilayer graphene (2) bilayer boron-nitride (BN) and (3) bilayer graphene-BN within a two-band tight-binding Harrison Hamiltonian and the Green's function technique. It is shown that in all three cases, the contribution of s and p_x or p_y orbitals have no states around the Fermi level, while for bilayer graphene and graphene-BN the total DOS and DOS of p_z orbital appear to be a linear function around this level. We show explicitly that for bilayer BN the contribution of p_z orbital does not have states around the Fermi level, because of ionization energy difference between the boron (B) and nitrogen (N) atoms. We find that the bandwidth of s , p_x or p_y is more extension than case of p_z orbital as a result of the Van-Hove singularities in the DOS. This leads to consideration of the PMS in two, low and high temperature, regions.

Keywords: Bilayer graphene; Boron-nitride; Susceptibility; Green's function; Tight-binding.

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