Orbital magnetism in ballistic graphene nanostructures

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We study the effect of small external magnetic fields on quasiparticles in graphene nanostructures within a semiclassical approach. Therefore we are focusing on magnetic susceptibilities of billiard-systems arising from the orbital motion of the charge carriers To this end we derive the semiclassical expression for the density of states which is closely related to the magnetic susceptibility, starting from an exact expansion for the Green function of a graphene flake. The results depend sensitively on the geometry of the billiard and the types of edges and differ from those of comparable 2DEG systems.