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Collective properties of magnetobiexcitons in quantum wells' and graphene superlattices OLEG BERMAN, ROMAN KEZERASHVILI, New York City College of Technology of CUNY, YURII LOZOVIK, Institute of Spectroscopy — The Bose-Einstein condensation and superfluidity of quasi-two-dimensional spatially indirect magnetobiexcitons in a slab of superlattice with alternating electron and hole layers consisting from the semiconducting quantum wells (QWs) and graphene superlattice in high magnetic field are reported. The two different Hamiltonians of a dilute gas of magnetoexcitons with a dipole-dipole repulsion in superlattices consisting of both QWs and graphene layers (GLs) in the limit of high magnetic field have been reduced to one effective Hamiltonian a dilute gas of two-dimensional excitons with the renormalized effective mass of the magnetoexciton, which depends on the magntic field. The instability of the ground state of the system of interacting two-dimensional indirect magnetoexcitons in a slab of superlattice with alternating electron and hole layers in high magnetic field is found. The stable system of indirect quasi-two-dimensional magnetobiexcitons, consisting of pair of indirect excitons with opposite dipole moments is considered. The density of the superfluid component $n_s(T)$ and the temperature of the Kosterlitz-Thouless phase transition to the superfluid state in the system of two- dimensional indirect magnetobiexcitons, interacting as electrical quadrupoles, are obtained for both the QW and graphene realizations.

Oleg Berman
New York City College of Technology of CUNY

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