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Localization of excitons in $Cd_{1-x}Mn_XTe$ semimagnetic semiconductors near temperature of phase transition : paramagnetic-spin glass
YURIJ GNATENKO, PETRO BUKIVSKIJ, Institute of Physics of NASU — Excitons in semimagnetic semiconductors become trapped by fluctuations of the crystal field as in ordinary solid solution based on II-YI semiconductors. In addition, magnetic-polaron effects are seen in these crystals. These effects stem from an exchange interaction of electrons and holes bound in excitones with d electrons of the magnetic ions. As a result, there is an additional trapping of excitons. At magnetic ion concentration X>0.10 the trapping of excitons not only by fluctuation of the crystal-field potential but also by fluctuations of the crystal magnetization become important. In this paper we are reporting the study of the emission of excitons trapped by magnetization fluctuations at temperatures from 1.8 K to 100 K. Analysis the form and the temperature dependence of exciton band position allowed us to determine the temperature of the phase transitions to a spin-glass state in $Cd_{1-X}Mn_XTe$ (X=0.40) semimagnetic semiconductors which corresponds to T_{SG}=14.5 K.

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