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Dynamics of bright and dark localized excitonic magnetic polarons in CdMnTe spin glass compound YURIY GNATENKO, PETRO BUKIVSKIJ, YURIY PIRYATINSKI, Institute of Physics of National Academy of Science of Ukraine — The measurements of the magnetic properties of spin glass (SG) system indicate that the magnetic relaxation is characterized by a broad range of times below T_f. Here, for the first time, we have investigated time-resolved photoluminescence spectra of $Cd_{0.70}Mn_{0.30}Te$ SG compound at the temperature below the freezing temperature T_f. This enables us to study the dynamics of different localized excitonic magnetic polarons (LEMPs) at $T = 0.7T_f$excited in the crystal regions where various microscopic magnetic spin states (MMSSs) are formed. It was found that there is a broad distribution of the lifetimes of the LEMPs which have different lifetimes but same energies. It was shown that the presence of the long-lived LEMPs is caused by the admixture of the optically active bright exciton states to the dark exciton states as a result of the local magnetic fields formation. The lifetimes of these dark LEMPs correspond to hundreds of nanoseconds. It was also found that the decay process of the PL exciton band intensity is described by the Kohlrausch–Williams–Watts stretched exponential function which describes the recombination processes which correspond to the emission of the LEMPs formed in the crystal region of the finite clusters as well as the infinite cluster. These complex dynamical phenomena, observed for $Cd_{1-X}Mn_XTe$ at low temperatures, reflect the spatially heterogeneous dynamics in the SG system which is due to the presence of different MMSSs below T_f.

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