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Excitonic probing of magnetic spin states and their temperature evolution in semiinsulating CdMnTe spin-glasses YURIY GNATENKO, PETRO BUKIVSKIJ, Institute of Physics of National Academy of Sciences — Spin glass (SG) formation is one of the most complex and exciting problems in the condensed matter physics. In spite of the intensive theoretical and experimental investigations of SG systems, a number of issues still remain open. In particular, the relative concentrations (RCs) of "loose" (single) spins and various magnetic spin clusters in SGs is one of the important unanswered questions. Another problem is lack of detailed quantitative information on how these microscopic magnetic spin states (MMSSs) evolve with temperature. Here, we have investigated (MMSSs) {"loose spins, finite superparamagnetic, "locked" and infinite clusters} both above and below the freezing temperature in $Cd_{0.70}Mn_{0.30}Te$ SG. We used the localized exciton magnetic polarons (LEMPs), which we observed in the photoluminescence spectra, as a probe of these state. This makes it possible for the first time to estimate the MMSS's RCs and to study their temperature evolution and thus to elucidate one of the most important issues in this field of research. Furthermore, the findings described here may encourage researchers for more detailed studies of freezing process in various inhomogeneous magnetic glassy systems, especially, in dilute magnetic semiconductors – a very promising materials for spintronics. This also opens intriguing prospects for further studies of spin freezing and frozen states in these systems, especially under influence of extrinsic factors (magnetic field, pressure, ultrasound etc).

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