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Spin-sensitive transient absorption measurements in CdTe high above the band gap P. NEMEC, P. NAHALKOVA, D. SPRINZL, P. HORODYSKY, E. BELAS, J. FRANC, P. MALY, Charles University in Prague, Ke Karlovu 3, 121 16 Prague 2, Czech Republic — Spin-sensitive dynamics of carriers optically generated and probed high above the band gap in CdTe have been measured by time-resolved differential transmission experiments using 80 fs pump and probe pulses with the same $(\Delta T/T)_{++}$ and opposite $(\Delta T/T)_{+-}$ circular polarization. These experiments were motivated by the recent observation that in GaAs, depending on the photon excess energy $h\nu - E_g$, the degree of circular polarization (DCP= $[(\Delta T/T)_{++} - (\Delta T/T)_{+-}] / [(\Delta T/T)_{++} + (\Delta T/T)_{+-}]$) could be positive, negative or even zero [1]. In CdTe we observed that the results of pump-probe experiments are even more sensitive to the experimental conditions than in the case of GaAs. Namely, we show that for photoexcited carriers with certain excess energies and concentrations there is a sign change not only in DCP but also in $\Delta T/T$ (an absorption bleaching changes to an induced absorption). We conclude that all these effects are a consequence of interplay between the state filling and the spin-sensitive band gap renormalization. We acknowledge fruitful discussions with J. T. Devreese. This work was supported by the Ministry of Education of the Czech Republic (project 1K03022). [1] Y. Kerachian, P. Nemeč, H. M. van Driel, A. L. Smirl, APS March meeting, paper H26 8, p. 407, Montreal, Canada, 2004.

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