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Low temperature pulsed electrically detected magnetic resonance on a-Si:H p-i-n solar cells THOMAS HERRING, HEATHER SEIPEL, DANE MCCAMEY, CHRISTOPH BOEHME, University of Utah, CRAIG TAYLOR, Colorado School of Mines, JIAN HU, FENG ZHU, ARUN MADAN, MV Systems, Golden, CO — Hydrogenated amorphous silicon (a-Si:H) has become one of the most important semiconductor materials, with applications including solar cells and thin film transistors. In spite of this, and more than 30 years of intensive studies of this material, the microscopic nature of various recombination mechanisms in this material are still not well understood. Recently, pulsed electrically and optically detected magnetic resonance (p-EDMR, p-ODMR, respectively) spectroscopy has provided a method for directly and quantitatively observing some of these microscopic processes. Here, we present p-EDMR measurements on a-Si:H p-i-n solar cells at temperatures $T \leq 40K$, with a comparatively low light excitation density. After a short, coherent microwave excitation, we record transients for a range of externally applied magnetic fields. The results show the presence of a number of resonances, which we discuss with regard to previous continuous wave (cw-) ESR and cw-EDMR studies, as well as cw- and p-ODMR measurements.

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