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Magnetic field effect on the optoelectronic response of amorphous hydrogenated silicon. RYAN MCLAUGHLIN, DALI SUN, CHUANG ZHANG, University of Utah, EITAN EHRENFREUND, Technion University, ZEEV VALY VARDENY, University of Utah — We have studied the magneto-photoluminescence and magneto photoconductivity in amorphous hydrogenated silicon (a-Si:H) thin films and devices as a function of temperature up to field of 5 Tesla. The magnetic field effects (MFE) are interpreted as spin mixing between spin-singlet and spin-triplet charge pairs due to the "delta-g" mechanism that is based on the g-value difference between the paired electron and hole, which directly affects the rate of radiative recombination and charge carrier separation, respectively. We found that the MFE(B) response does not form a Lorentzian (that is expected from the "delta-g" mechanism) due to disorder in the film that results in a broad distribution of e-h recombination rates, which could be extracted directly by time-resolved photoluminescence.

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