Abstract Submitted
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Lifetime investigations of recombination in CdTe heterostructures using time-resolved photoluminescence[1] BOBBY L. HANCOCK, CRAIG H. SWARTZ, MADHAVIE EDIRISOORIYA, ELIZABETH B. LEBLANC, O. NORIEGA, P. A. R. D. JAYATHILAKA, OLANREWAJU S. OGEDENGBE, MARK HOLTZ, THOMAS H. MYERS, Texas State University — Free photocarrier lifetimes are critical parameters in semiconductors used in photovoltaics, such as cadmium telluride (CdTe). However, CdTe is historically plagued by short photocarrier lifetimes due to competing non-radiative recombination attributed to surfaces and interfaces. One consequence of this is an elusive lifetime for the bulk material. We report progress in mitigating the effects of surfaces and interfaces using a CdTe/$Mg_{1-x}Cd_xTe$ double heterostructure grown by molecular beam epitaxy. Photocarrier lifetimes are measured using time-resolved photoluminescence (TRPL). Lifetimes as high as 240 ns are measured at room temperature with barriers having approximately x = 35%. The results of these studies will be presented along with a discussion of the radiative, surface, and interfacial recombination.

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