

Abstract Submitted
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Designing long wavelength barrier based thermophotovoltaic cells

DANTE DEMEO, THOMAS VANDERVELDE, Tufts University Dept. of Electrical and Computer Engineering — This work describes the process of designing low source-temperature thermophotovoltaic cells to harvest energy from thermal sources in the 7-10 micron range. Simulations of the bandstructure are performed for strained layer superlattices (SLS) to act as the p, B, and n regions in a TPV barrier diode. Simulations of the band-alignment of these regions are then performed to ensure a high enough barrier in one band, and a smooth transition in the other. The process is performed iteratively to find an ideal match of specific SLS material and doping concentration in each region. Both conduction band barriers and valence band barriers have been investigated. The balance of system and test apparatuses will also be discussed, as well as preliminary results from samples grown via MBE.

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