# Thermophotovoltaic Solar 3 Cells

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To improve the conversion efficiency of thermophotovoltaic devices, we ...

Solar thermophotovoltaic (STPV) systems use an intermediate module that absorbs the solar radiation, and re-radiates photons at high temperatures with tailored wavelengths toward a photovol-taic (PV) cell (Fig.1). By converting the incident solar radiation to a narrow-band thermal emission matched to the spectral response

Based on the principle of detailed balance, we calculate a limiting solar conversion efficiency of 85% for fully concentrated sunlight and 45% for one sun with an absorber and single-junction cells of equal areas. Solar thermoradiative-photovoltaic systems outperform similar solar thermophotovoltaic converters for low band gaps and practical ...

Solar Thermophotovoltaics (STPVs) are solar driven heat engines which extract electrical power from thermal radiation. The overall goal is to absorb and convert the broadband solar radiation spectrum into a narrowband thermal emission spectrum tuned to the spectral response of a photovoltaic cell (PV) [1] .

P.J. Ker, in Solar Energy, 2023. Abstract. Thermophotovoltaic (TPV) technology harvests ...

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Solar thermophotovoltaic system. (a) Schematic of a typical STPV configuration. The sun-to-absorber and emitter-to-cell efficiency is, respectively, sketched in blue and orange. (b) The overall efficiency of an ...

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