

# GaSb ARRAYS FOR SOLAR THERMOPHOTOVOLTAIC SYSTEM

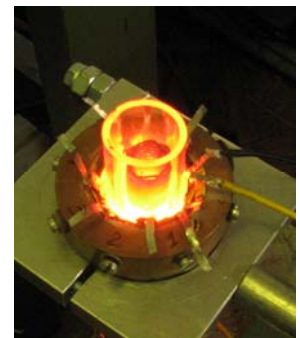
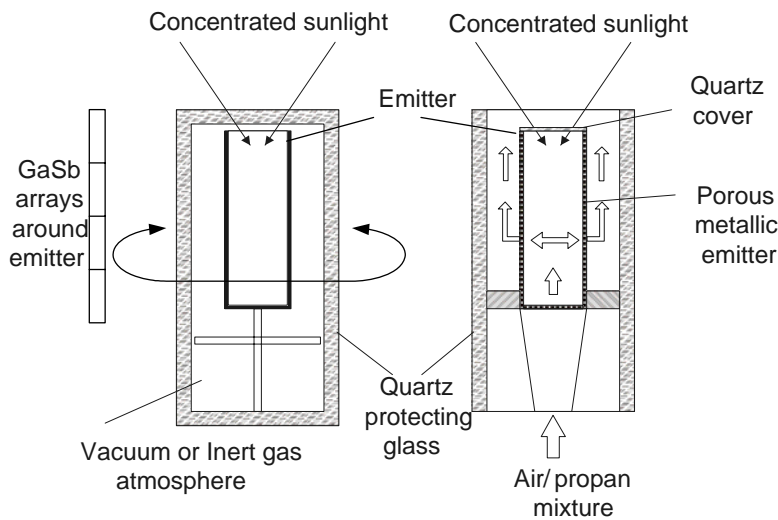


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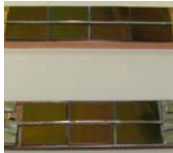
The main advantage of thermophotovoltaic (TPV) systems is the possibility of building a hybrid unit utilizing solar and fuel energies. There might be two main approaches for the hybrid system building: total switching between the sources (i.e. use of different emitters for solar and fuel sources) and use of the same emitter for both sources. The developed solar-fuel TPV system was tested in both regimes.

## Solar TPV system      Solar+ fuel TPV system

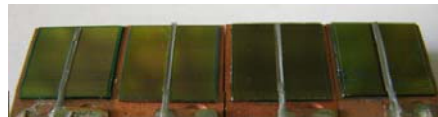


Gas-fired operation of the solar+fuel system.

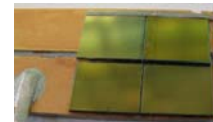
## Investigated GaSb arrays



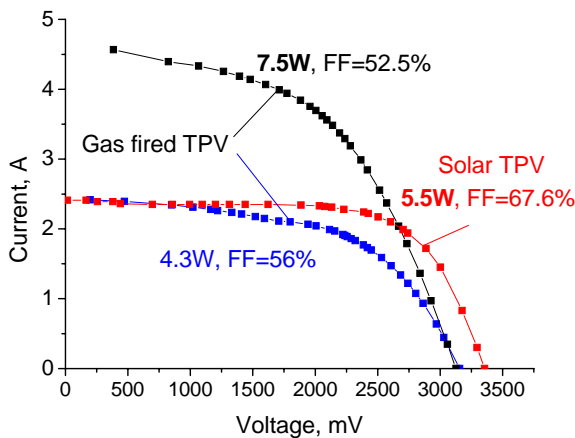
Arrays of four and three  $1 \times 1 \text{ cm}^2$  GaSb cells connected in parallel



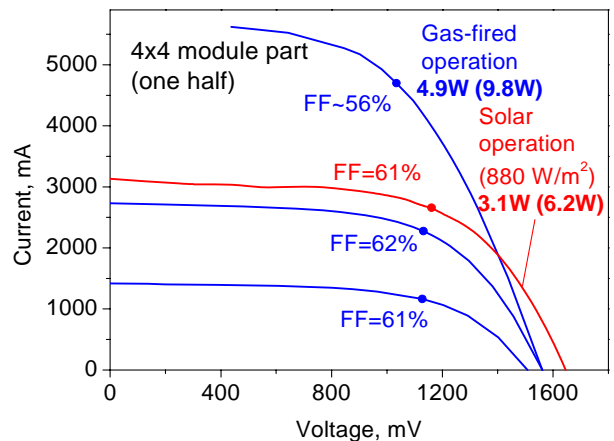
Arrays of four  $1 \times 1 \text{ cm}^2$  GaSb cells connected in parallel – the second connection way.



Arrays of four  $1 \times 1 \text{ cm}^2$  GaSb cells  $8 \times 9 \text{ mm}^2$  connected in series-parallel way on ceramics.



I-V curves of the full-size module (8 series connected arrays of three  $1 \times 1 \text{ cm}^2$  GaSb cells) taken in the solar and fuel fired regimes



I-V curves of the advanced TPV receiver with 4 series connected arrays of 8 arrays (four GaSb  $1 \times 1 \text{ cm}^2$  cells in each array) installed and connected in series.

Developed GaSb arrays allows to insure high efficient conversion of concentrated solar and fuel fired emitter radiation. The power estimated for the full TPV module (8 series connected arrays of three  $1 \times 1 \text{ cm}^2$  GaSb cells) in the gas-fired regime is 9.8 W.