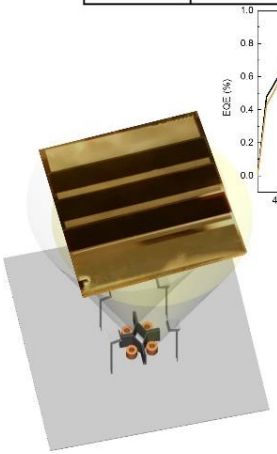
Newsletter

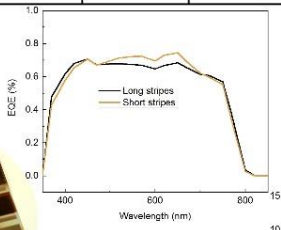
October 2019

In search of narrower band gap

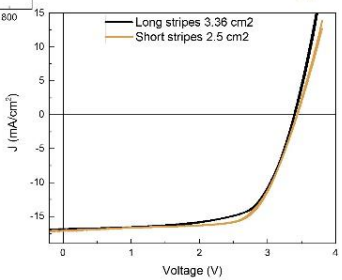
PerTPV partner, the University of Valencia, is focusing on the formation of perovskite using sublimation methods. Routinely, small pixels are prepared for materials and solar cell development, yet the method is readily scalable to larger areas. As a proof of that scalability larger area devices (> 3 cm^2) were prepared. Due to the insufficient conductivity of the front transparent electrode, the cells were deposited as long stripes connected in series. The separation achieved by shadowmasks is far from optimum indicating that the area coverage is not optimized. Yet these “mini-modules” were prepared at high yield exhibiting high Voc’s and FF which demonstrates the scalability of the sublimation method.

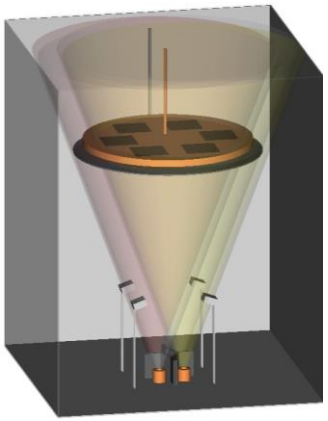
Sample	Area (cm^2)	V_{oc} (V)	J_{sc} (mA/cm^2)	FF (%)	PCE (%)
Long stripes	3.36	**3.400**	16.8	67.4	12.8
Short stripes	2.52	**3.439**	17.1	69.3	13.6

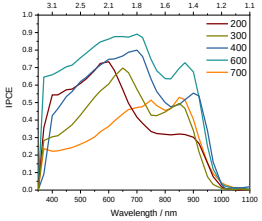


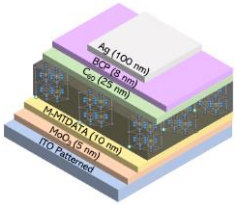


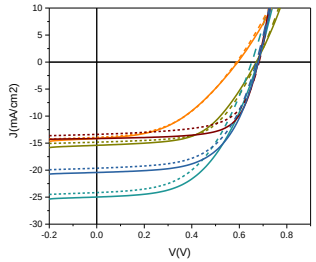
Towards larger area







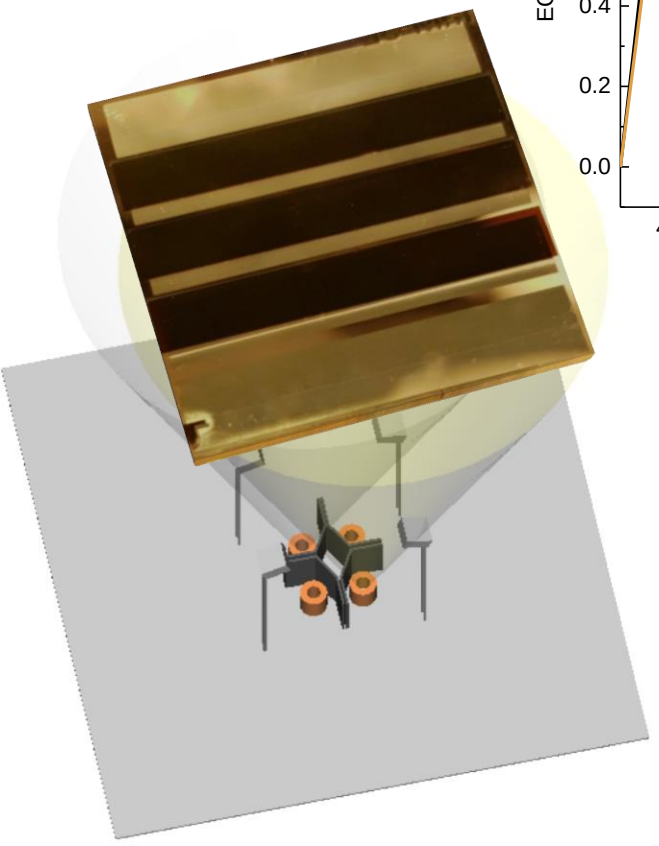


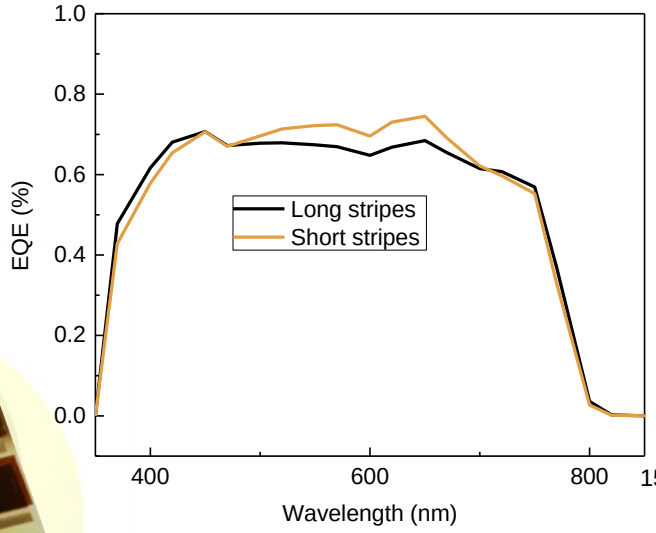


PerTPV partner, the University of Valencia, is developing low bandgap perovskites by co-sublimation of tin(II), lead(II) and cesium halide salts and the organic salt, methylammonium iodide. Perovskite absorbers with a bandgap of 1.35 eV were developed with a high reproducibility. Initial use of these absorbers in planar solar cells led to power conversion efficiencies close to 9 %.

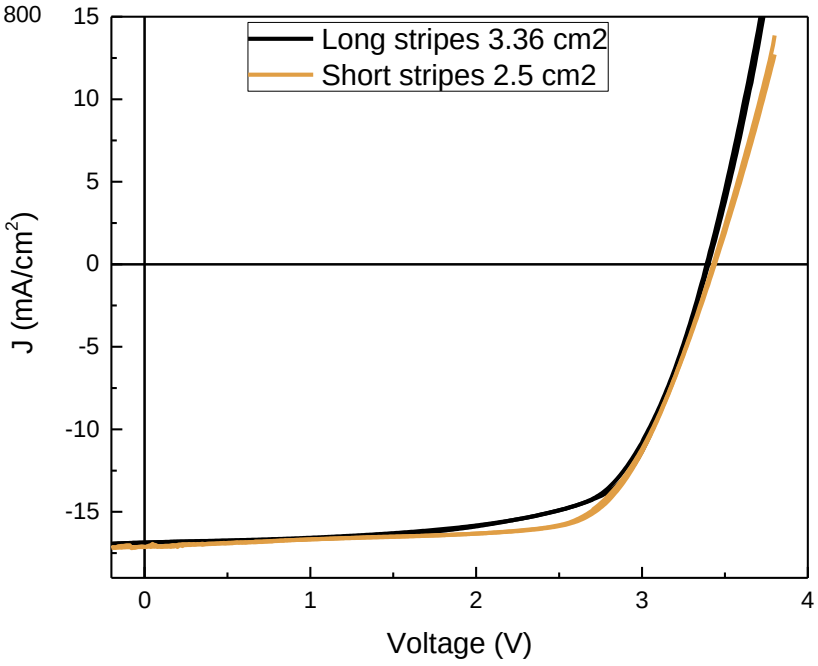
The PerTPV project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No. 763977.

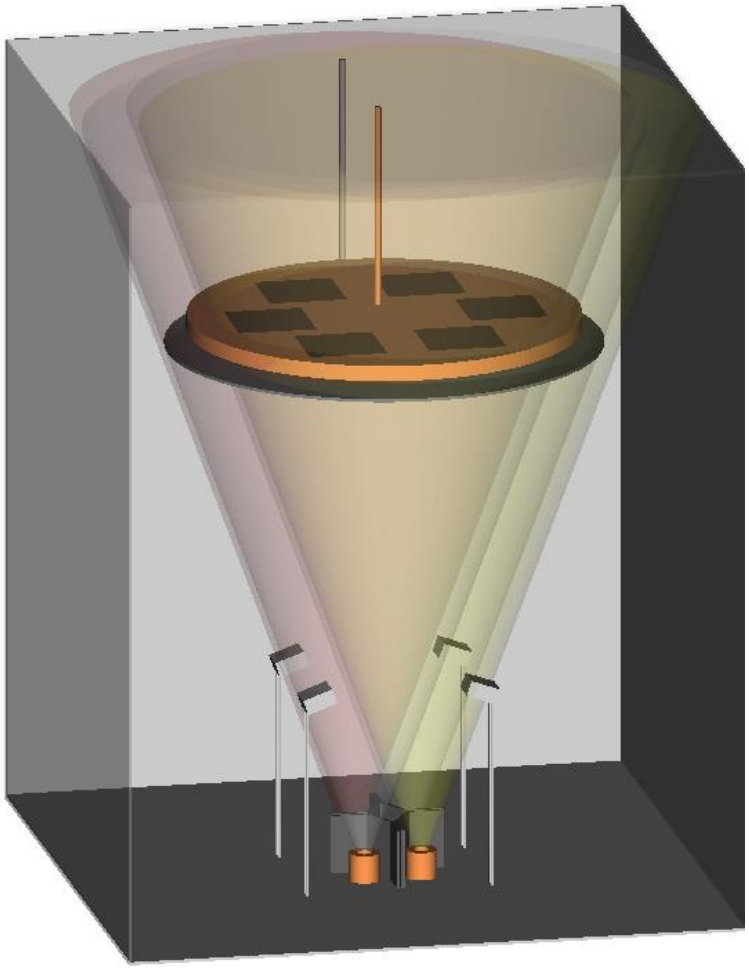
Sample	Area (cm^2)	V_{oc} (V)	J_{sc} (mA/cm^2)	FF (%)	PCE (%)
Long stripes	3.36	**3.400**	16.8	67.4	12.8
Short stripes	2.52	**3.439**	17.1	69.3	13.6

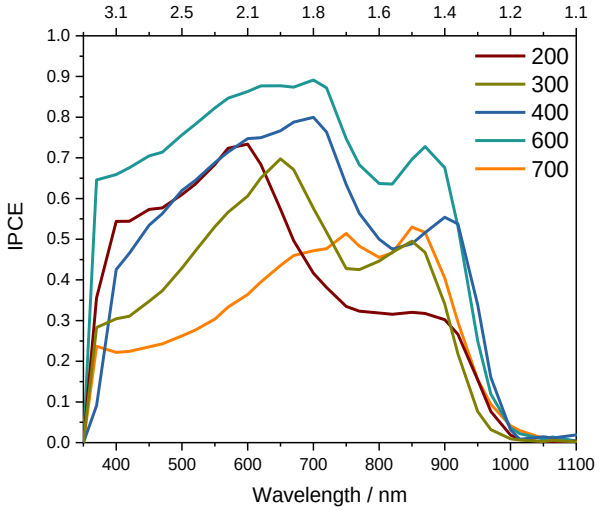


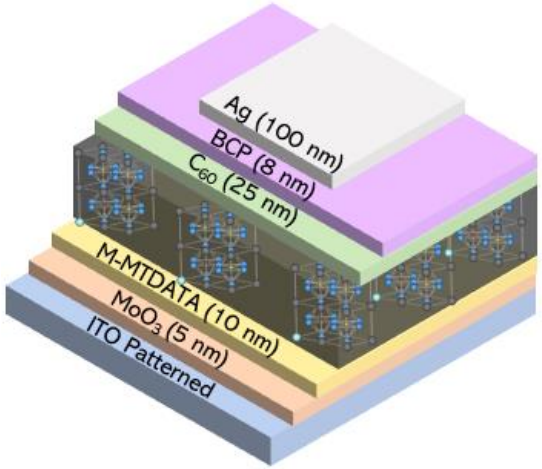


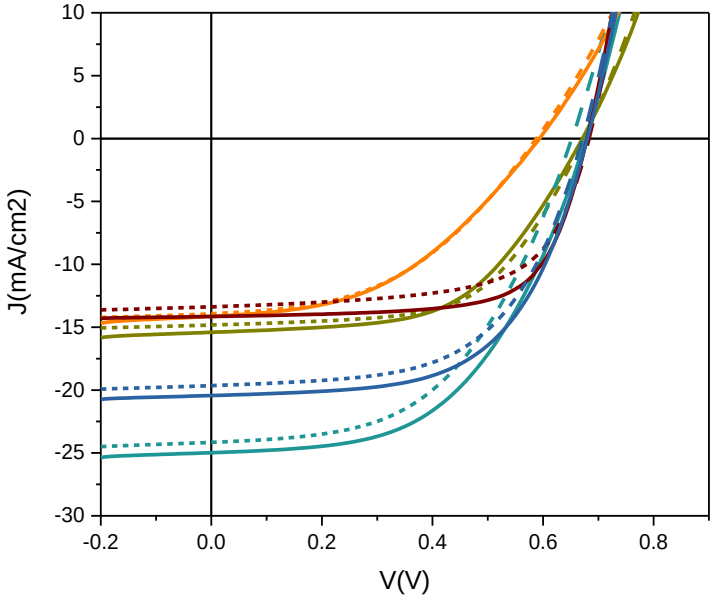
Towards larger area






3.1
2.5
2.1
1.8
1.6
1.4
1.2
1.1
IPCE
200
300
400
600
700
Wavelength / nm


Ag (100 nm)
BCP (8 nm)
C60 (25 nm)
M-MTDATA (10 nm)
MoO3 (5 nm)
ITO Patterned


J(mA/cm2)
V(V)