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Ultrafast, self-powered and charge-transport-layer-free photodetectors based on high-quality evaporated $CsPbBr_3$ perovskites for applications in optical communication

Xingyue Liu[a], Zhiyong Liu[a], Xianhua Tan[a], Bo Sun[a], Junjie Li[a], Han, Fang[a], Shuang Xi[b], Tielin Shi[a], Zirong Tang[a] and Guanglan Liao[a,c]*

[a] *State Key Laboratory of Digital Manufacturing Equipment and Technology, Huazhong University of Science and Technology, Wuhan 430074, China*

[b] *School of Mechanical and Electronic Engineering, Nanjing Forestry University, Nanjing 210037, China*

[c] *Shenzhen Huazhong University of Science and Technology Research Institute, Shenzhen 518057, China*

** Address correspondence to (G. Liao) guanglan.liao@hust.edu.cn.*

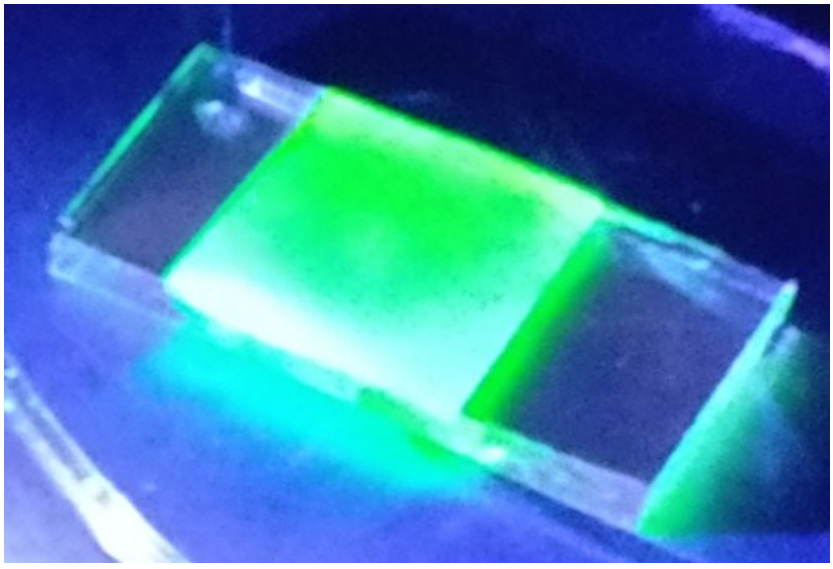

Fig. S1. The fluoresce image of the sequentially evaporated cesium lead bromide film (with an effective area about 1.2 cm × 1.2 cm) taken under the illumination of 375 nm UV light.

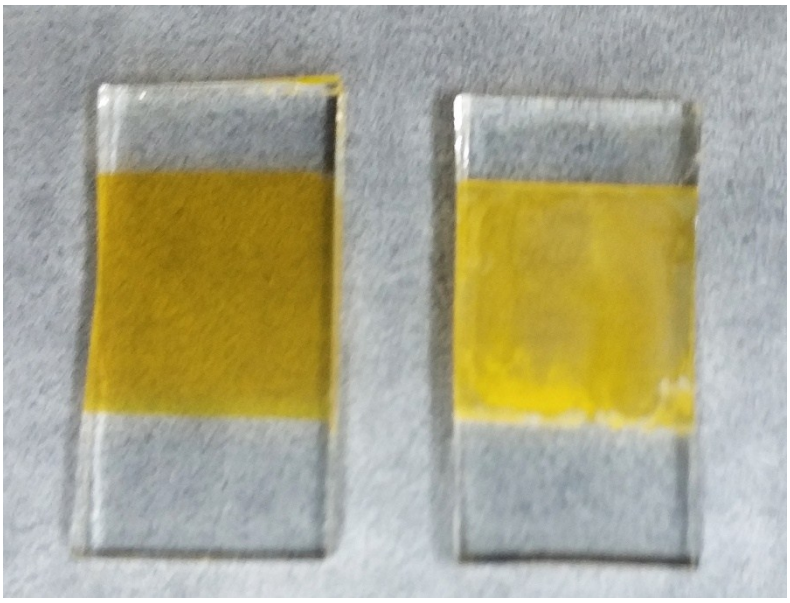

Fig. S2. Camera image of the $CsPbBr_3$ films prepared via sequential evaporation (left) and traditionally two-step solution method (right).

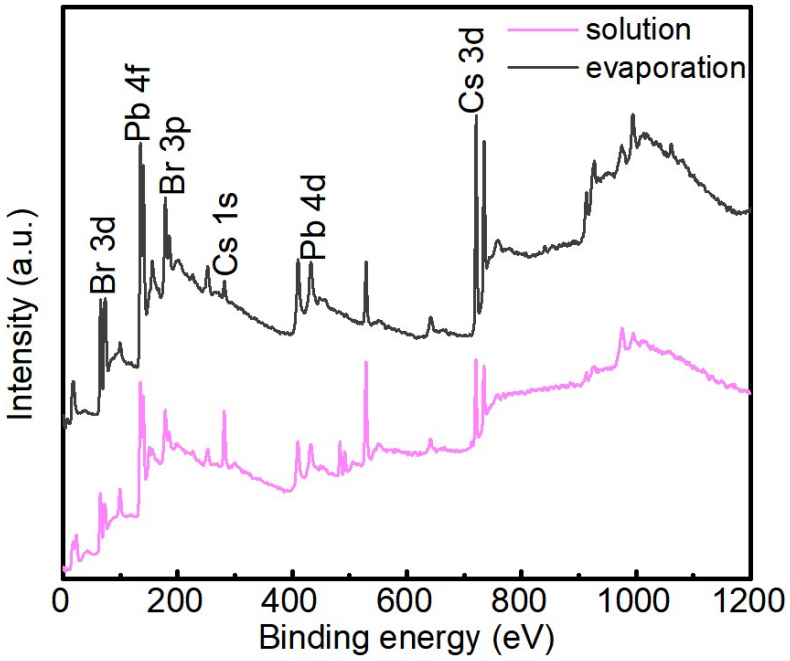

Fig. S3. XPS survey of the conventionally solution-processed and evaporated $CsPbBr_3$ films.

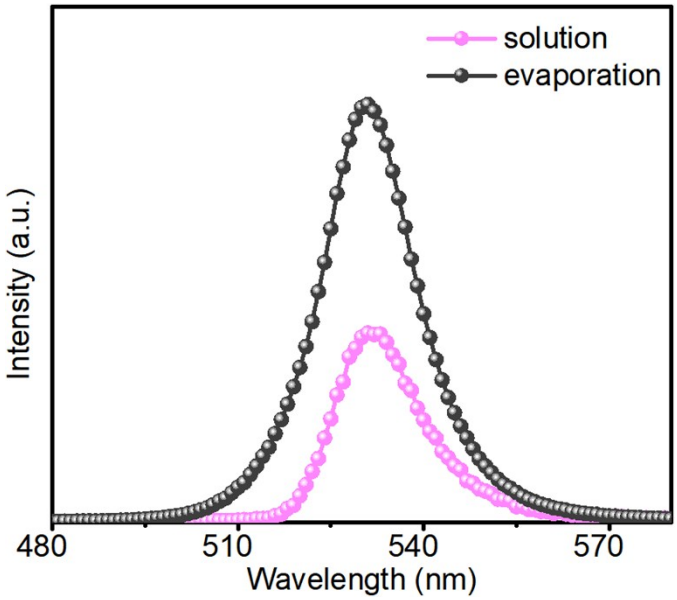

Fig. S4. Steady-state PL of the solution-processed and evaporated $CsPbBr_3$ films deposited on ITO substrates.

Table S1 Lifetime parameters of the solution-processed and evaporated $CsPbBr_3$ films.

Sample	τ_{ave} [ns]	τ_1 [ns]	A_1	τ_2 [ns]	A_2
solution-processed $CsPbBr_3$	8.34	17.69	0.31	6.37	4.08
evaporated $CsPbBr_3$	17.40	22.88	0.86	7.16	1.47

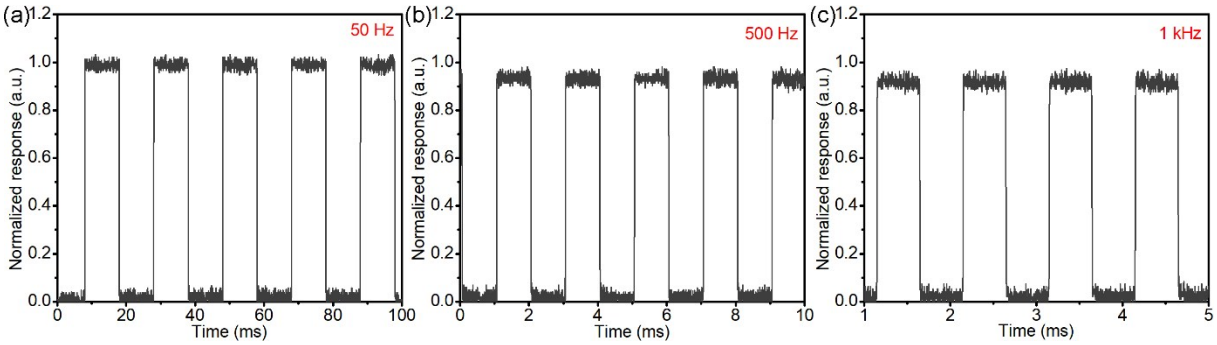

Fig. S5. Photoresponse of the PMMA-modified device recorded under 450 nm illumination at varied frequencies of (a) 50 Hz, (b) 500 Hz and (c) 1 kHz.