

## Supporting Information

# “High-Performance Blue Perovskite Light-Emitting Diodes Based on the “Far-Field Plasmonic Effect” of Gold Nanoparticles”

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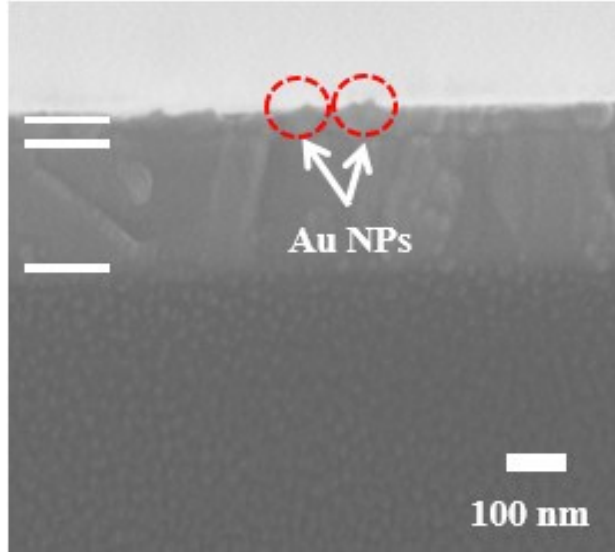


Figure S1 Cross-section scanning electron microscope (SEM) image of PEDOT:PSS mixed with gold nanoparticles (Au NPs) with 0.5:1 v/v.

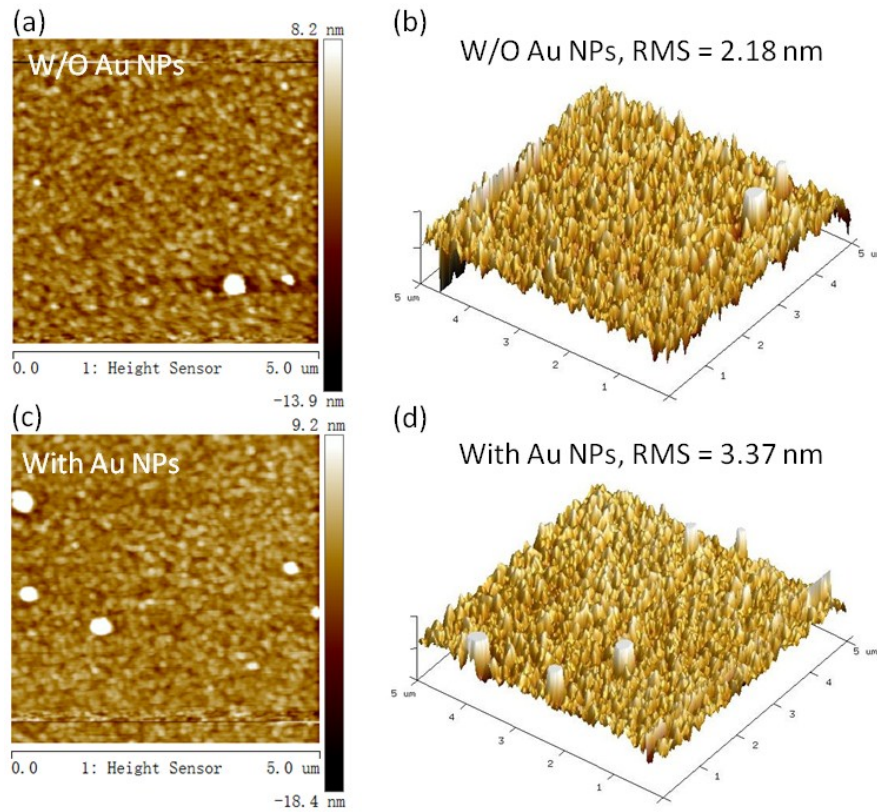


Figure S2 AFM images of surface topography (a, c) and surface roughness (b, d) of PEO:PEA<sub>2</sub>(CsPbBr<sub>x</sub>Cl<sub>3-x</sub>)<sub>n-1</sub>PbBr<sub>4</sub> film with (c, d) and without (a, b) Au NPs. RMS represents a root mean square surface roughness value.

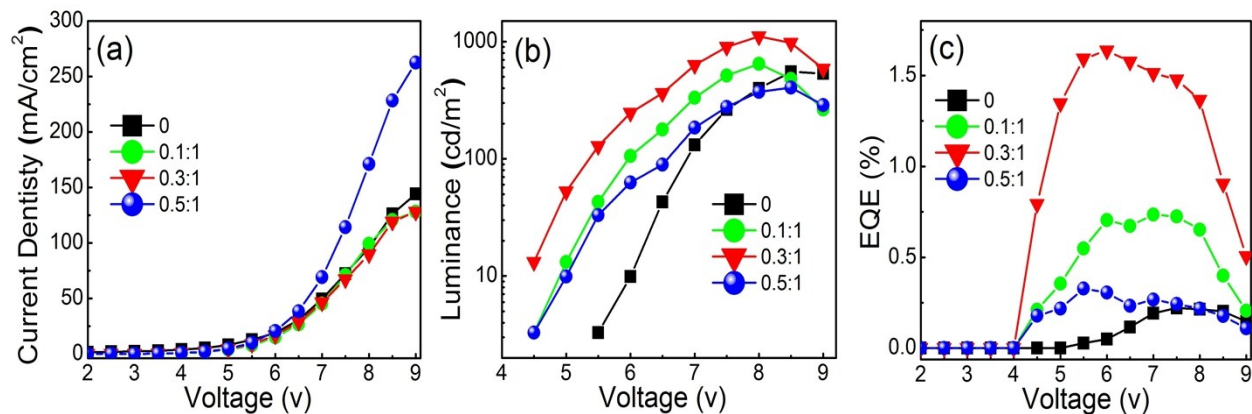


Figure S3 Performance characterization of blue PeLEDs with different volume ratio of Au NPs in the HTL. (a) Current density-voltage ( $J$ - $V$ ), (b) Electroluminescence intensity-voltage ( $L$ - $V$ ) and (c) External quantum efficiency-voltage ( $EQE$ - $V$ ) characteristics of devices.

Table S1 Performance characteristics of PeLEDs with different concentration of Au NPs.

Au NPs/PEDOT:PSS v/v	$V_{on}$ (V)	$L_{max}$ (cd/m <sup>2</sup> )	$CE_{max}$ (cd/A)	$EQE_{max}$ (%)
0:1	5.0	553.476	0.20	0.22
0.1:1	4.0	645.722	0.67	0.74
0.3:1	4.0	1110.247	1.49	1.64
0.5:1	4.5	405.2235	0.3	0.33

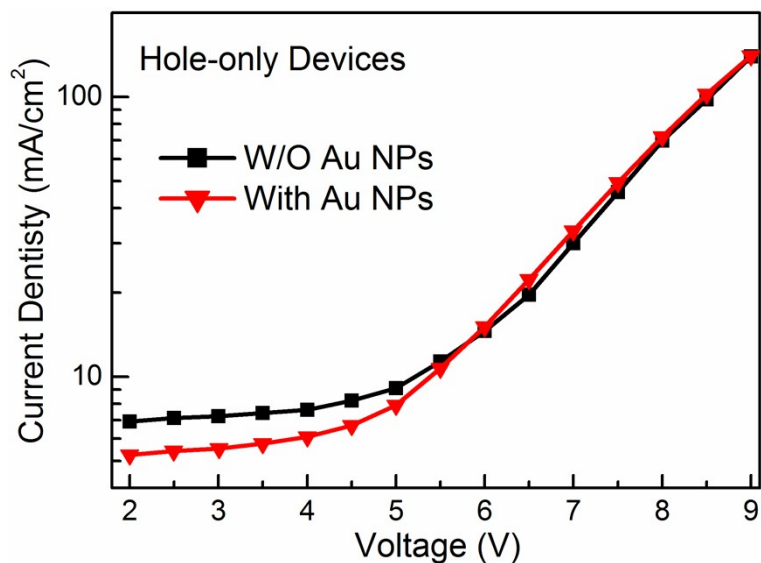


Figure S4 Current density-voltage ( $J$ - $V$ ) characteristics of hole-only devices with and without Au NPs.

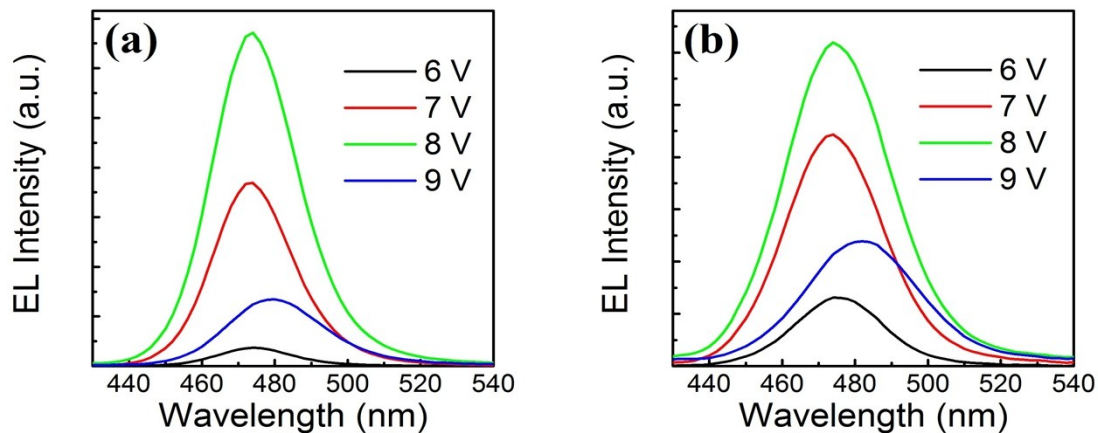


Figure S5 Electroluminescence spectra of PeLEDs (a) with and (b) without Au NPs at different device operation voltage.

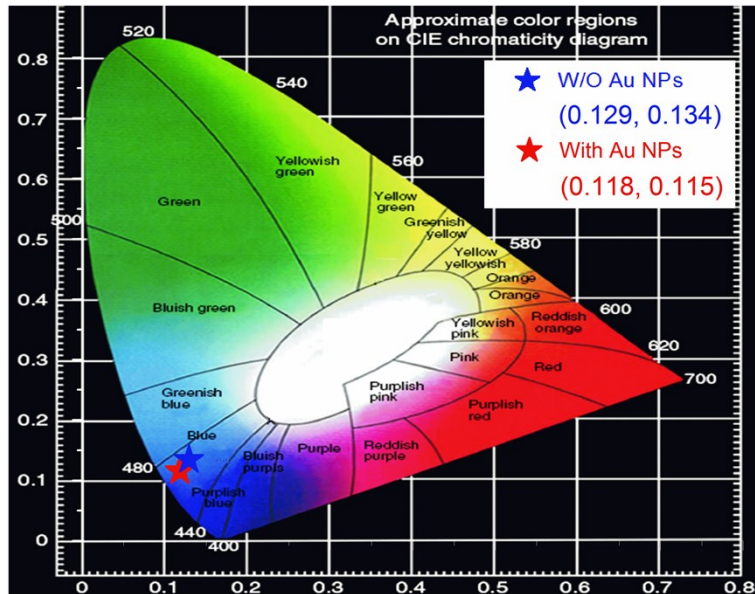


Figure S6 The Commission Internationale de l'Eclairage (CIE) color coordinates of PeLEDs with (red) and without (blue) Au NPs at 8 V.

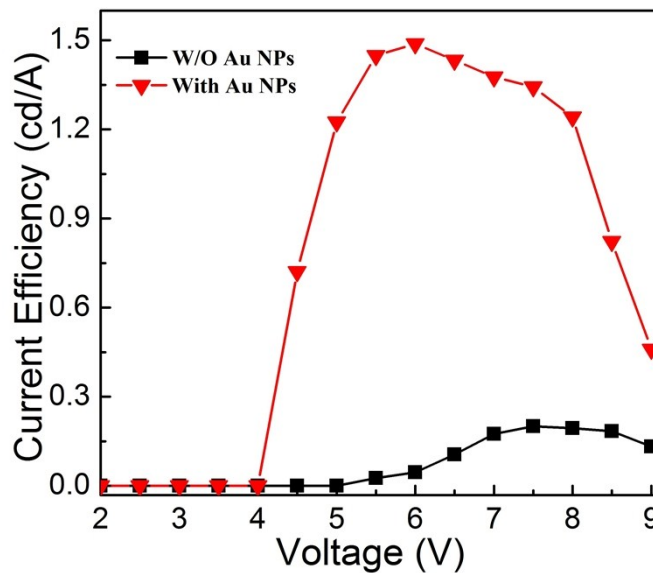


Figure S7 Current efficiency-voltage (*CE-V*) characteristics of PeLEDs with and without Au NPs.

Table S2 Performance characteristics of eight PeLEDs with the Au NPs at optimized ratio of 0.3:1 v/v.

<i>Device No.</i>	$V_{on}$ (V)	$L_{max}$ (cd/m <sup>2</sup> )	$CE_{max}$ (cd/A)	$EQE_{max}$ (%)
1	4.5	1008	1.24	1.36
2	4.0	905	1.37	1.51
3	4.0	1110	1.49	1.64
4	4.5	942	1.45	1.60
5	4.5	846	1.14	1.25
6	4.5	543	1.44	1.58
7	4.5	681	1.16	1.28
8	4.5	672	1.45	1.60
AVE	4.4	838	1.34	1.48

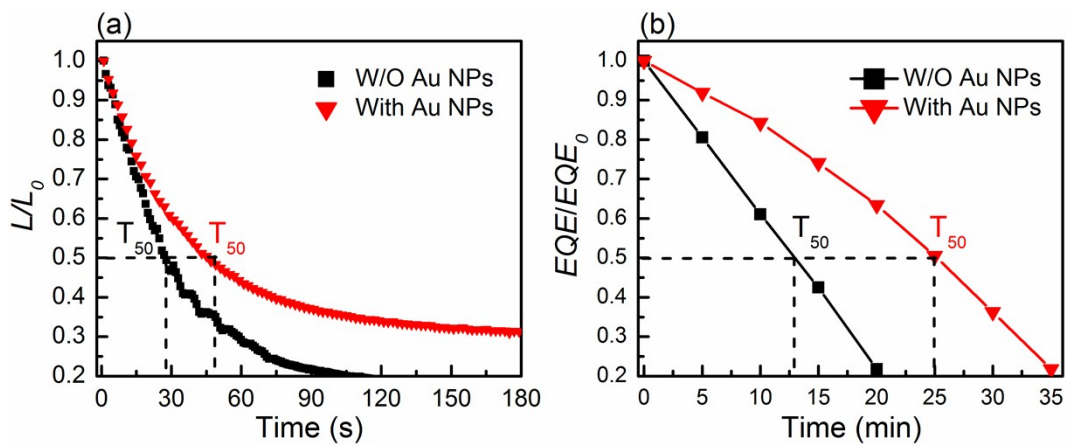


Figure S8 Stability of blue PeLEDs with and without Au NPs (with optimal ratio of 0.3:1 v/v). (a) luminance decay and (b) EQE decay as a function of time under continuous bias. The initial values of luminance decay ( $L_0$ ) and EQE decay ( $EQE_0$ ) were chosen at  $L_{max}$  and  $EQE_{max}$  respectively.