

Theoretical Estimation to Double the Performance of Perovskite Solar Cell using Graded Absorber Layer

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Table S1: Simulation results for partially graded ($y=0.2$ to 0.6) absorber PSC with different individual absorber thickness

Sl. No.	Individual layer thickness for a graded structure					Device parameters			
	FAPb _{0.4} Sn _{0.6} I ₃	FAPb _{0.5} Sn _{0.5} I ₃	FAPb _{0.6} Sn _{0.4} I ₃	FAPb _{0.7} Sn _{0.3} I ₃	FAPb _{0.8} Sn _{0.2} I ₃	J _{SC}	V _{OC}	FF	η
1.	68	68	68	68	68	32.80	~0.907	57.03	16.97
2.	100	100	70	40	30	33.35	0.91	57.66	17.61
3.	100	100	40	50	50	33.56	0.91	57.83	17.69
4.	100	100	50	50	40	33.50	0.91	58.01	17.77
5.	100	100	60	40	40	34.06	0.92	57.29	17.67
6.	100	100	65	45	30	33.40	0.92	57.85	17.70
7.	100	100	100	20	20	33.09	0.91	55.28	16.66
8.	100	100	30	60	50	33.65	0.91	57.86	17.71
9.	120	100	50	50	20	33.72	0.91	57.15	17.63
10.	120	100	50	40	30	33.68	0.91	57.19	17.61
11.	120	100	30	40	50	33.79	0.91	57.30	17.62
12.	120	80	70	40	30	33.39	0.91	57.67	17.63
13.	150	100	40	30	20	34.01	0.91	55.35	17.09
14.	150	100	50	30	10	33.96	0.90	55.02	16.90
15.	200	100	20	10	10	34.52	0.90	56.51	17.63
16.	230	70	20	10	10	34.53	0.90	56.57	17.66
17.	230	50	40	10	10	34.27	0.90	56.17	17.69
18.	50	50	40	100	100	32.73	0.91	56.43	16.82

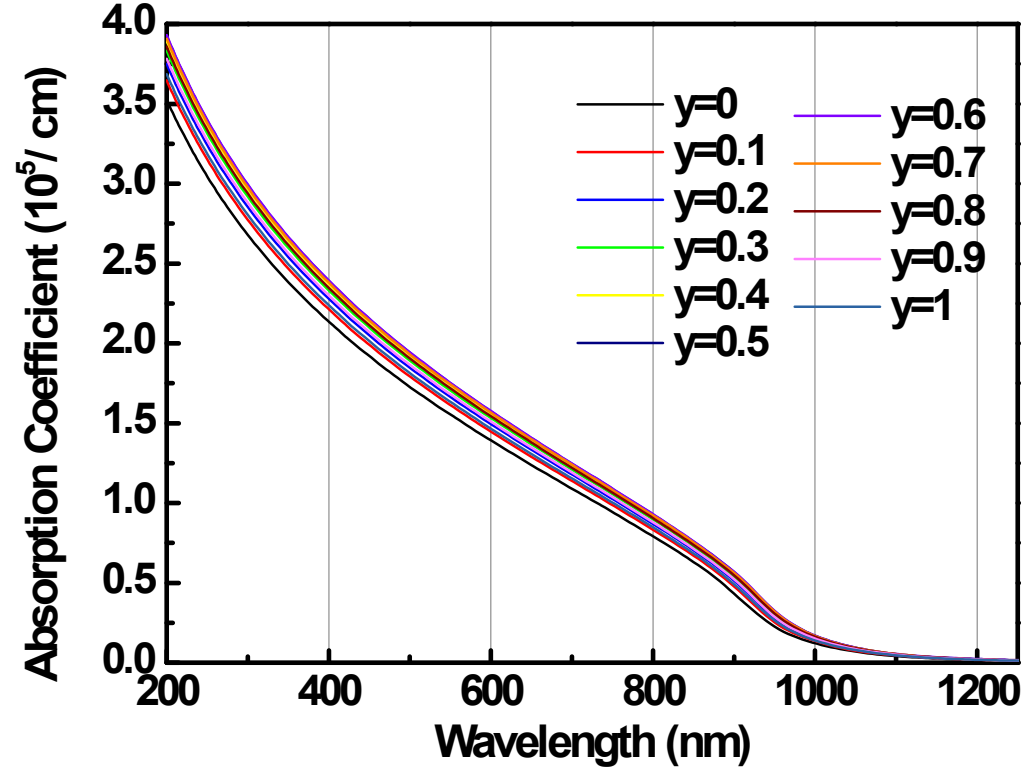


Fig S1: Absorption plot for the graded perovskite absorber $FAPb_{1-y}Sn_yI_3$ with all the compositions $y= 0$ to 1

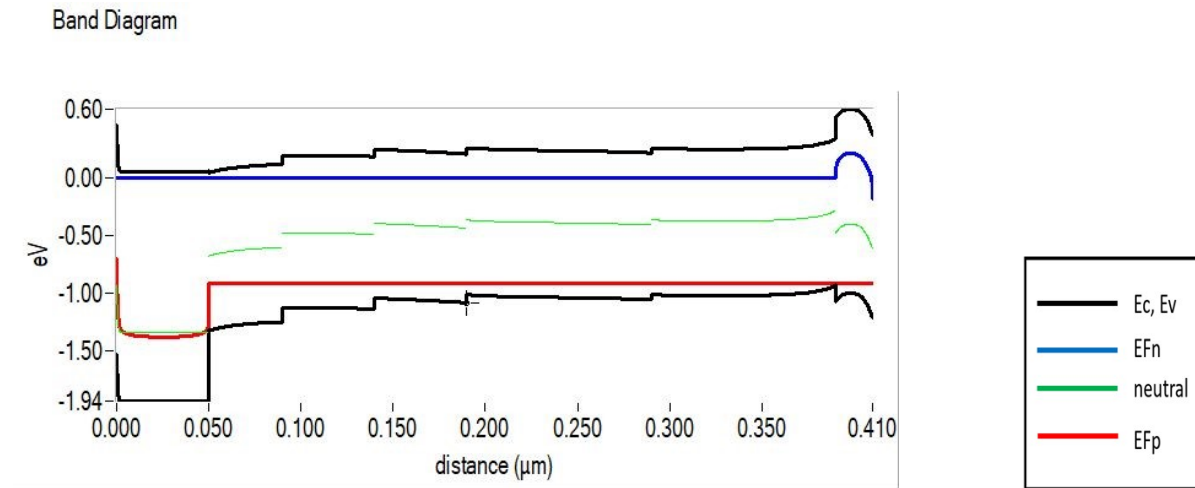


Fig S2: Energy band diagram for partially graded PSC with $y= 0.2$ to 0.6 with optimized individual layer thickness

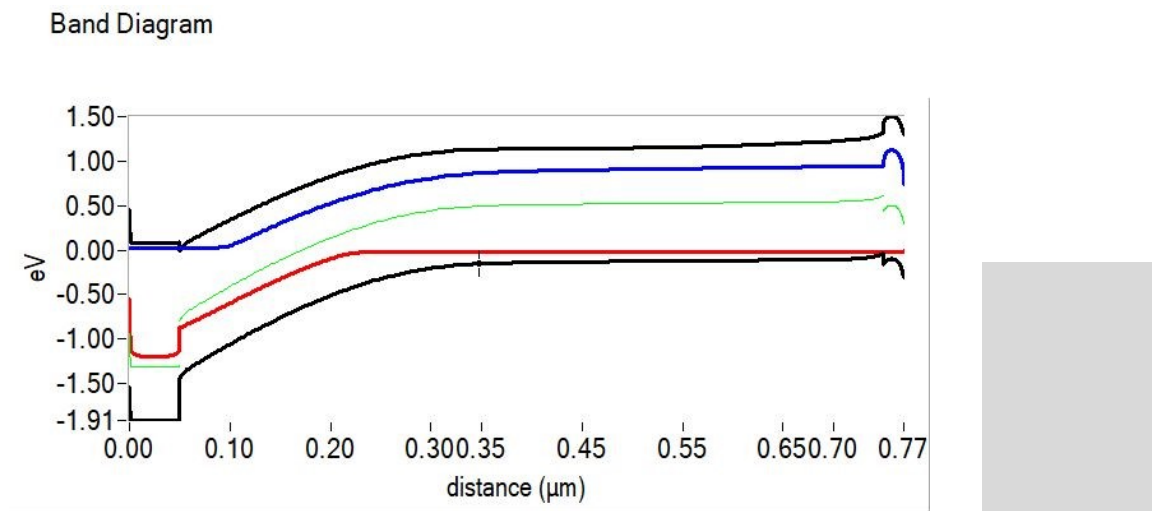


Fig S3: *Energy band diagram for partially graded PSC with $y= 0.2$ to 0.6 with optimized individual layer thickness*

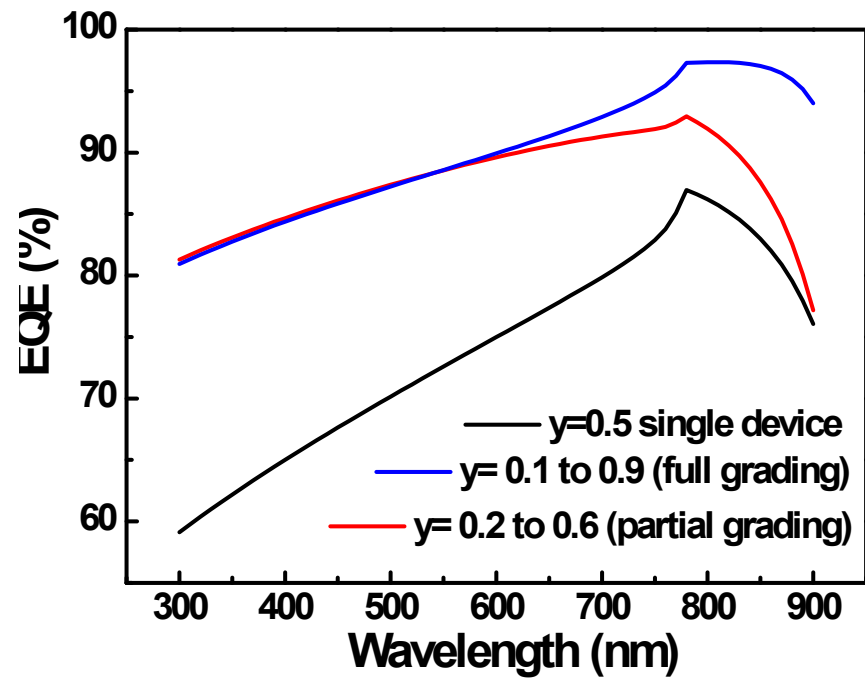


Fig S4: *EQE plot for single layer, partially-graded and full graded device*

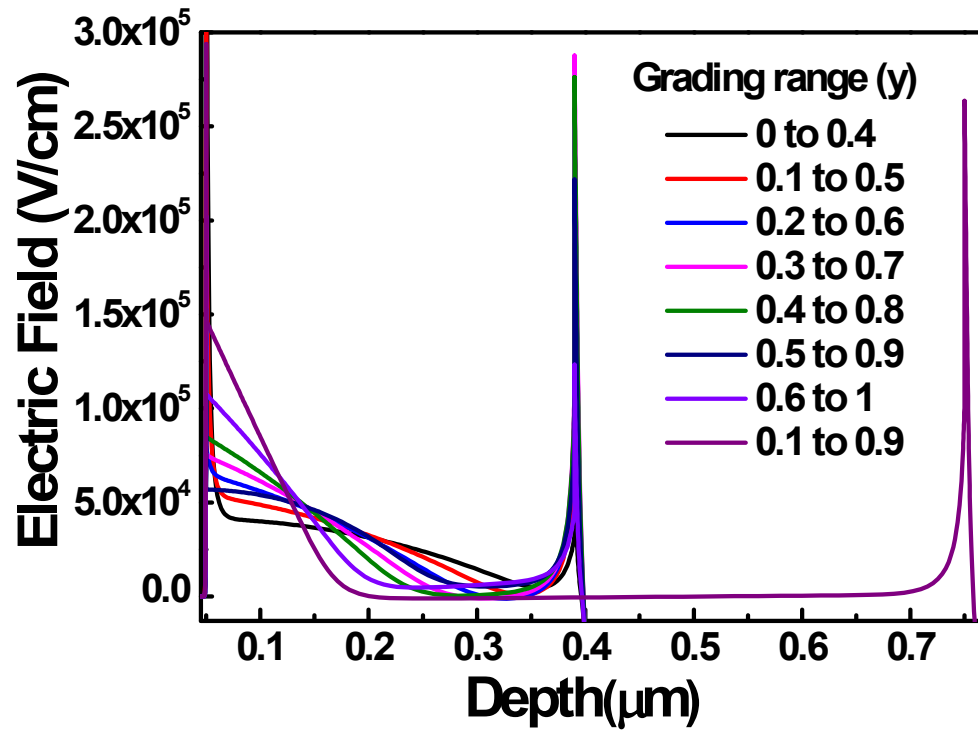


Fig S5: *Internal electric field for partially-graded and full graded devices*