Supplementary Information

Theoretical Analysis of Electron Transport in Perovskite Thin Films

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1) Explanation for the choice of width of energy disorder (W)

Mosconi et. al. [34] determined that in $MAPbI_3$, shallow potential wells of the order of 100 to 200 meV exist. This means that the sites involved in transport have their energies lying within a range of W=100 meV (see **Figure S1**). In our study we perform simulations for W=69 meV (main text) and W=100 meV (SI). Both are of the same order and therefore lead to similar results.
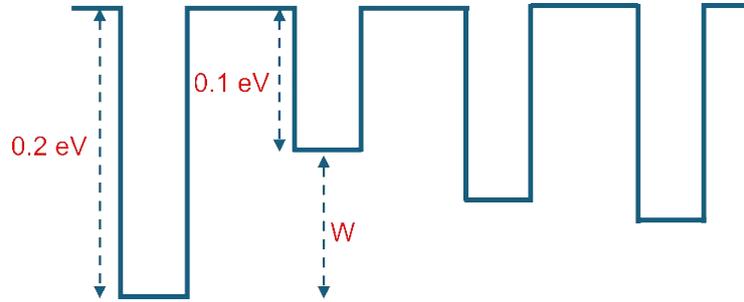
Figure S1: Schematic to explain the choice of width of the disorder.

2) Result of Temperature Dependent Study with $W = 100\ meV$
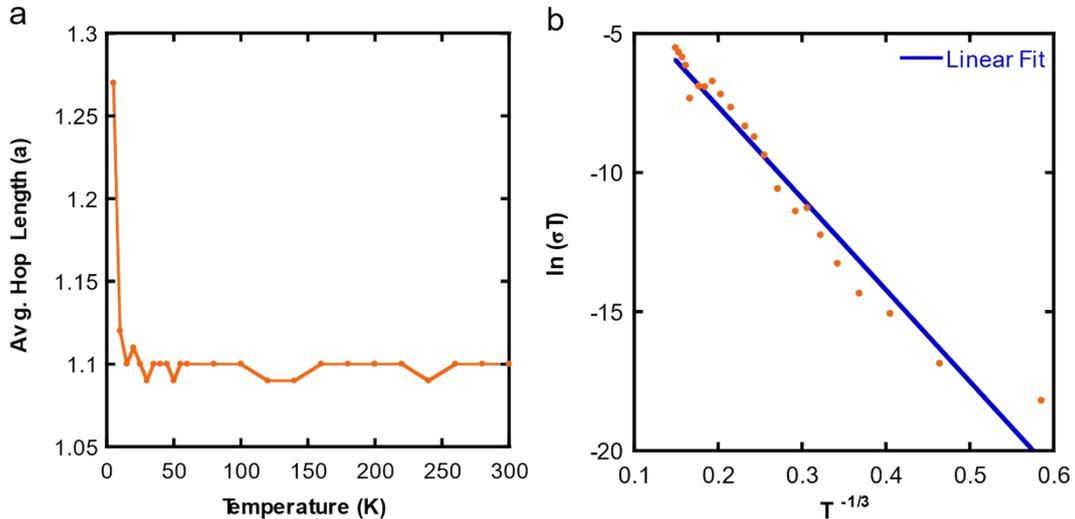
Figure S2: a) Average Hopping Length as a function of Temperature **(b)** $\ln(\sigma T)$ vs $T^{-1/3}$

From the fit (**figure S2b**) one gets,

$$T_o = 35.74 \times 10^3\ K \text{ and } \alpha_2 = 7.7$$

Thus, similar effects are observed for both $W = 69$ and $W = 100\ meV$

3) Result of Temperature Dependent Study with W=100 meV
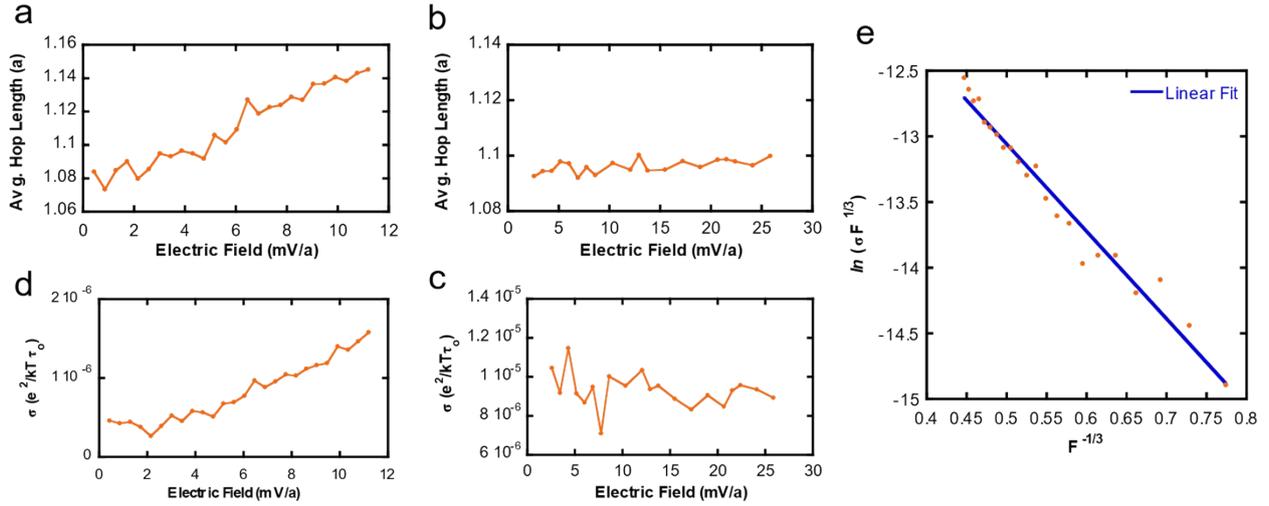
Figure S3: a) Average hopping length as a function of Electric Field at 40 K **(b)** Average hopping length as a function of Electric Field at 300 K **(c)** Conductivity as a function of Electric Field (F) at 40 K **(d)** Conductivity as a function of Electric Field (F) at 300 K **(e)** $\log(\sigma F^{1/3})$ vs $(F^{-1/3})$ at 40 K. The blue line is a linear fit.

Thus, similar effects are observed for both $W = 69$ and $W = 100$ meV