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**Carrier trapping and recombination: the role of defect physics in enhancing the open circuit voltage of metal halide perovskite solar cells**

By: Leijtens, Tomas; Eperon, Giles E.; Barker, Alex J.; Grancini, Giulia; Zhang, Wei; Ball, James M.; Kandada, Ajay Ram Srimath; Snaith, Henry J.; Petrozza, Annamaria  
Energy & Environmental Science (2016), 9(11), 3472-3481 | Language: English, Database: CAlplus  
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**Abstract:** One of the greatest attributes of metal halide perovskite solar cells is their surprisingly low loss in potential between bandgap and open-circuit voltage, despite the fact that they suffer from a non-negligible d. of sub gap defect states. Here, we use a combination of transient and steady state photocurrent and absorption spectroscopy to show that CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub> films exhibit a broad distribution of electron traps. We show that the trapped electrons recombine with free holes unexpectedly slowly, on microsecond time scales, relaxing the limit on obtainable open-circuit voltage (V<sub>oc</sub>) under trap-me.

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**Identifying and suppressing interfacial recombination to achieve high open-circuit voltage in perovskite solar cells**

By: Correa-Baena, Juan-Pablo; Tress, Wolfgang; Domanski, Konrad; Anaraki, Elham Halvani; Turren-Cruz, Silver-Hamill; Roose, Bart; Boix, Pablo P.; Gratzel, Michael; Saliba, Michael; Abate, Antonio; et al  
Energy & Environmental Science (2017), 10(5), 1207-1212 | Language: English, Database: CAlplus  
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**Abstract:** With close to 100% internal quantum efficiency over the absorption spectrum, photocurrents in perovskite solar cells (PSCs) are at their practical limits. It is therefore imperative to improve open-circuit voltages (V<sub>oc</sub>) in order to go beyond the