

ULTRAFAST EXTREME ULTRAVIOLET SPECTROSCOPY OF METHYLAMMONIUM LEAD IODIDE PEROVSKITE FOR CARRIER SPECIFIC PHOTOPHYSICS

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Methyl ammonium lead iodide (perovskite) is a leading candidate for next-generation solar cell devices. However, the fundamental photophysics responsible for its strong photovoltaic qualities are not fully understood. Ultrafast extreme ultraviolet (XUV) spectroscopy was used to investigate relaxation dynamics in perovskite with carrier specific signals arising from transitions from the common inner-shell level (I 4d) to the valence and conduction bands. Ultrashort (30 fs) pulses of XUV radiation in a broad spectrum (40-70 eV) were obtained using high-harmonic generation in a tabletop instrument. Transient absorption measurements with visible pump and XUV probe directly observed the dynamics of charge carriers after above-band and band-edge excitation.