dissipation-theory--Study-18

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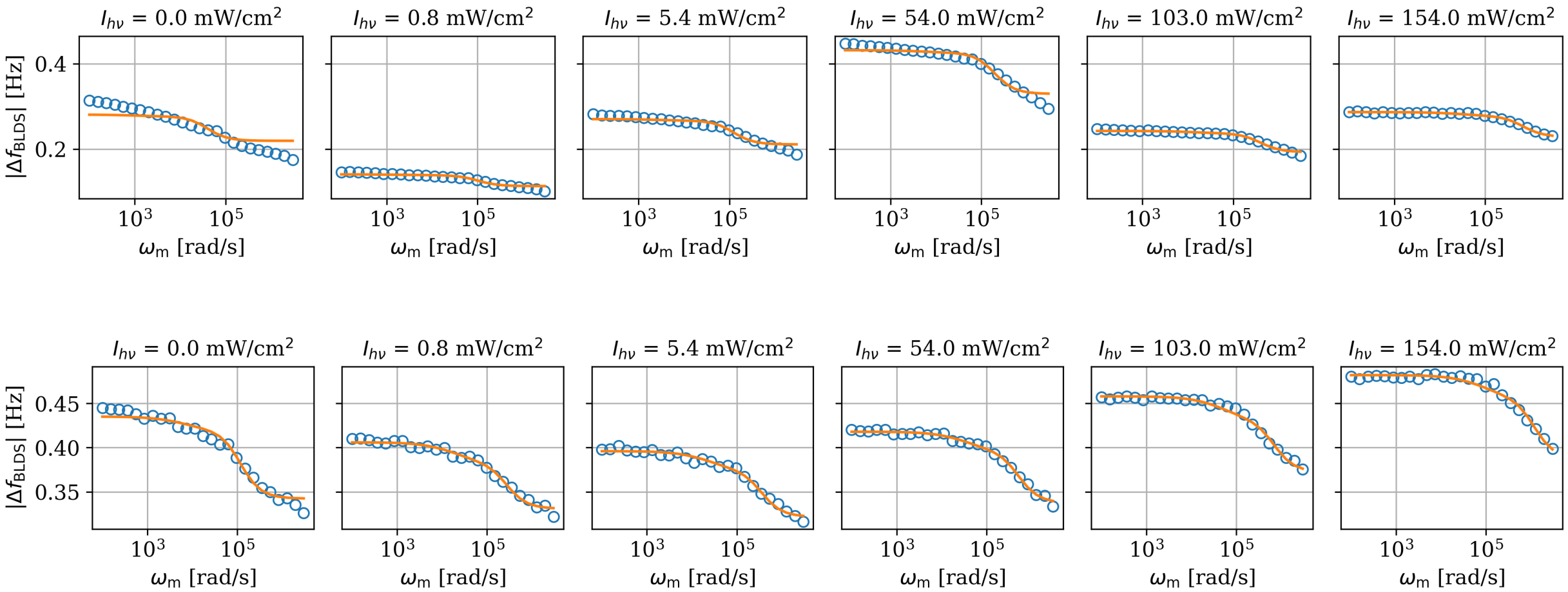
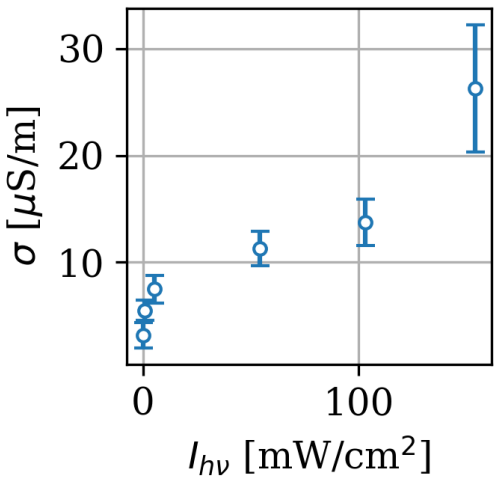
Summary. BLDS spectra of PM6:Y6 over two different substrates, ITO and PEDOT:PSS/ITO, were collected versus irradiation intensity and fit to Roger Loring's 2LR theory.

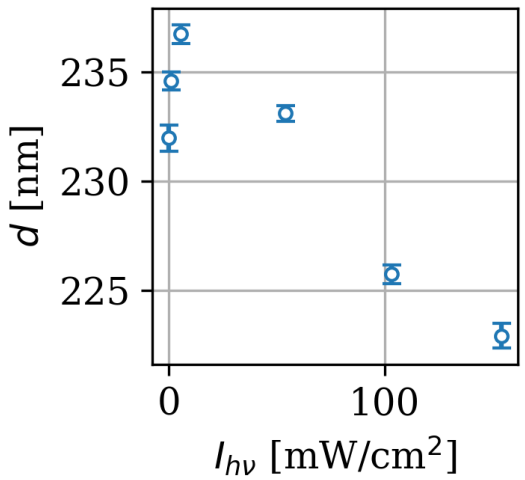
Methods. Spectra were collected by RC in May, June, and October of 2023 and delivered to JM for fitting as tab-separated value (.tsv) files with four columns each. The first column was the modulation frequency, the second column was the dc frequency shift, and the third and fourth column were the in-phase and out-of-phase lock-in frequency shift, respectively. The dc frequency shift was fit because the lock-in frequency shift was 30x larger and consequently required an unphysically small tip-sample to describe the signal. In each fit, the tip-sample separation, charge mobility, and charge density were free parameters while the sample dielectric constant and thickness were fixed at 3.4 + 0 j and 110 nm, respectively. The sample was represented using "Model I" in Lekkala *JCP* 2013. To mimic a metallic substrate, the dielectric substrate in Model I was taken to have a dielectric constant of 10^6 + 0 j. Data was fit using non-linear least squares, assuming uniform errors estimated from the fit residuals. Before fitting each data set, an initial guess for the best-fit parameters of each data set was obtained manually by trial-and-error. A total of five out of seven replicate samples gave reasonable fits and are presented below. For each sample at each light intensity, an estimated conductivity was computed from the best-fit charge mobility and charge density. The conductivity's standard error was estimated from the standard error in the charge mobility and charge density via propagation of error, ignoring for simplicity the (significant, non-zero) correlation in the best-fit charge mobility and charge density.

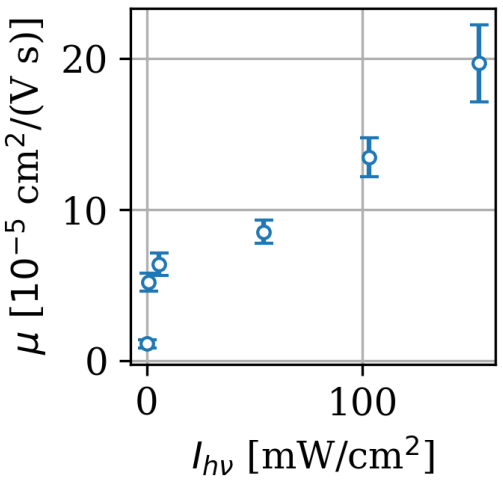
PM6:Y6/ITO blds spectra

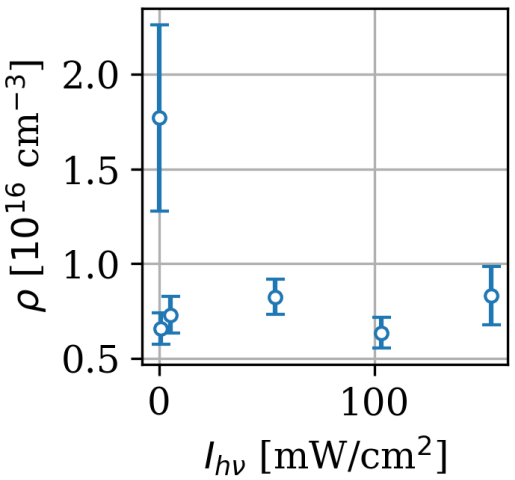


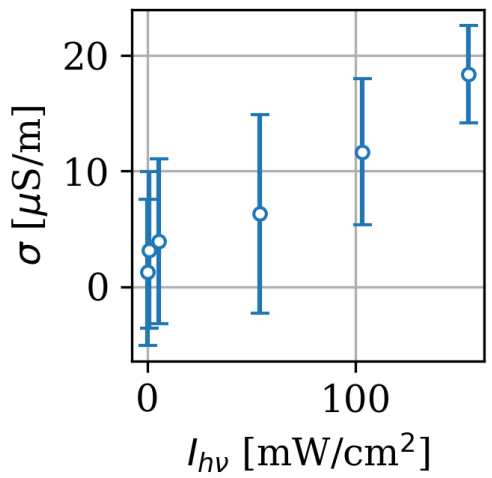
PM6:Y6/ITO findings

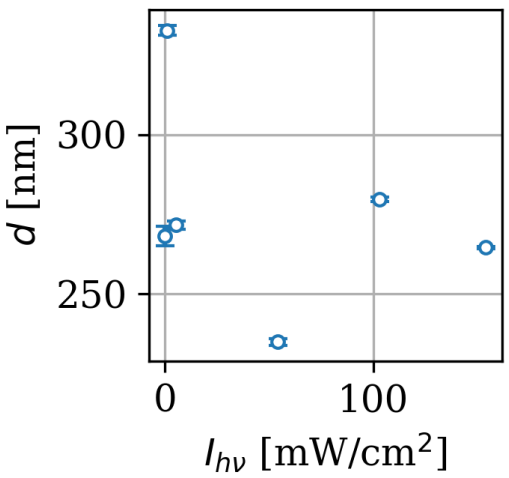


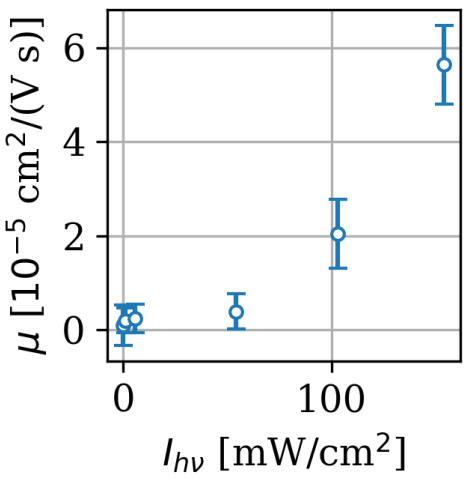


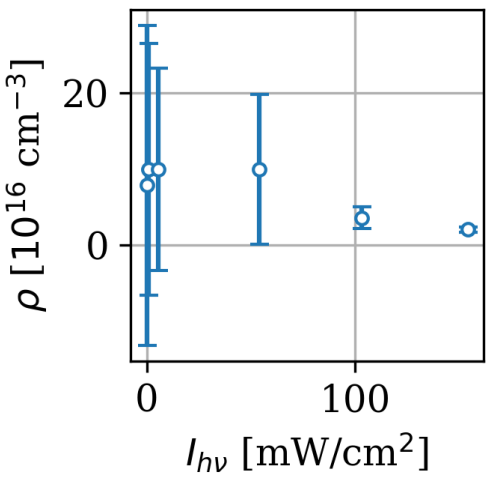




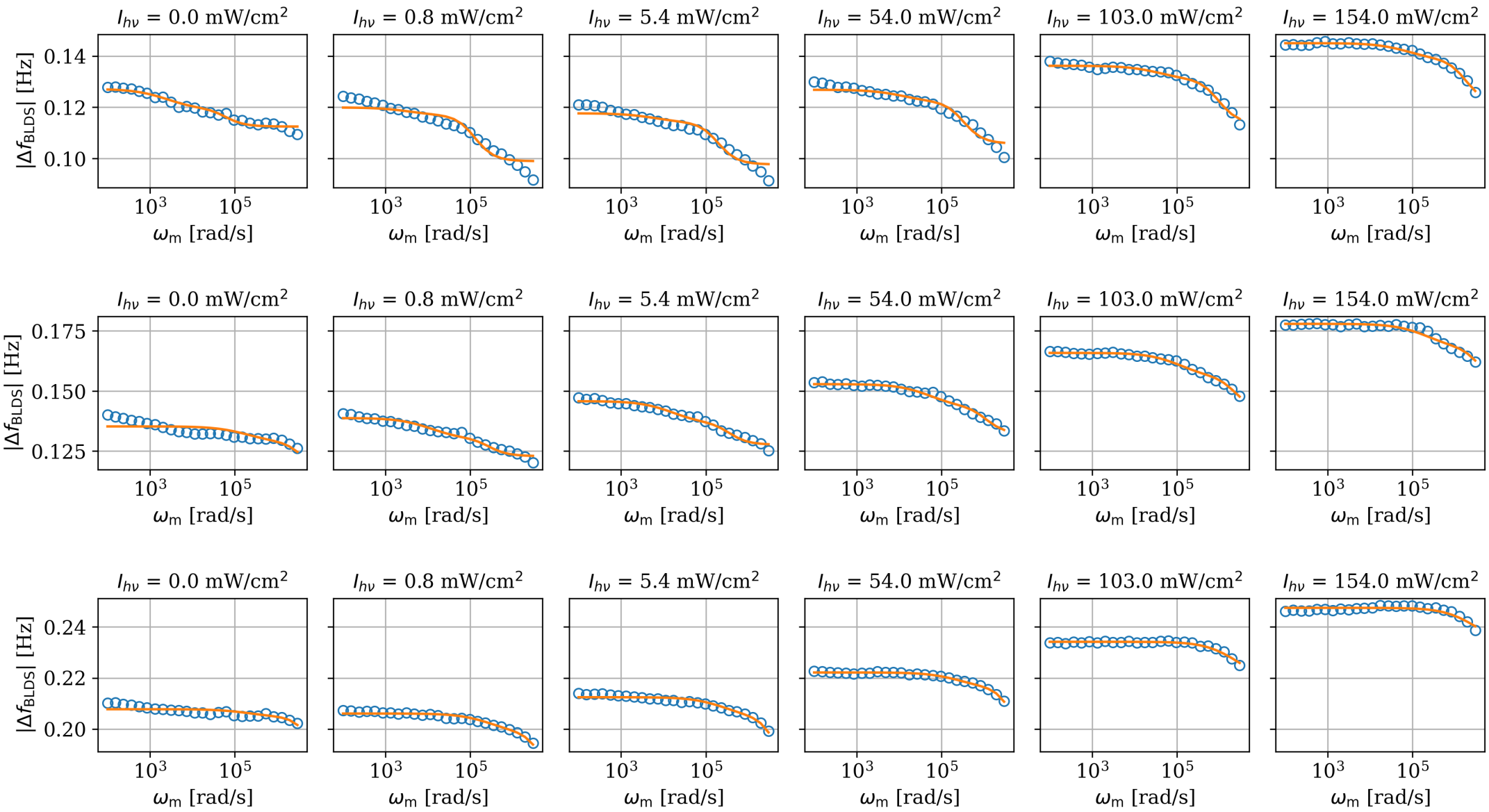








PM6:Y6/PEDOT:PSS/ITO blds spectra



PM6:Y6/PEDOT:PSS/ITO findings