Electronic Supplementary Information for PCCP article The exciton dynamics in tetracene thin films

Murad J. Y. Tayebjee,[*a] **Raphaël G. C. R. Clady,**[b‡] **and Timothy W. Schmidt**[a]

Received Xth XXXXXXXXXX 20XX, Accepted Xth XXXXXXXXX 20XX
First published on the web Xth XXXXXXXXXX 200X
DOI: 10.1039/b000000x

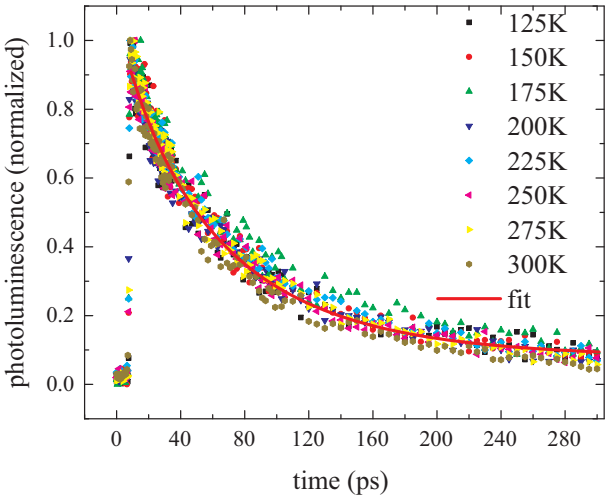


Fig. 1 Ultrafast time-resolved PL at 575 nm of tetracene thin films after pumping at 500 nm, achieving an exciton density of 4×10^{17} cm^{-3} at a number of different temperatures. The fit parameters are $1/k_1 = 80$ ps and $\beta_{ssa} = 0.34$.

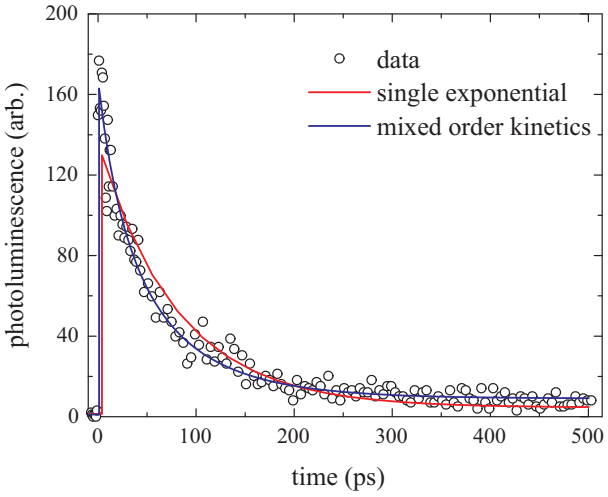


Fig. 2 Ultrafast time-resolved PL of tetracene thin films at 560 nm after pumping at 500 nm, achieving an exciton density of $\sim 8 \times 10^{17}$ cm^{-3}. The single exponential fit uses of value of $1/k_1 = 80$ ps. The mixed kinetics model uses an additional parameter $\beta_{ssa} = 0.54$.

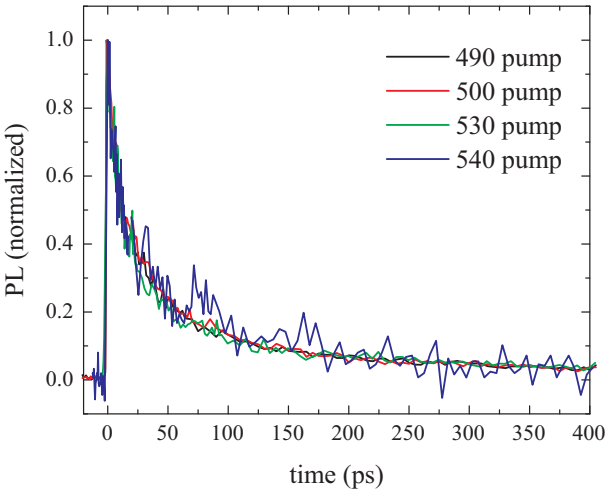
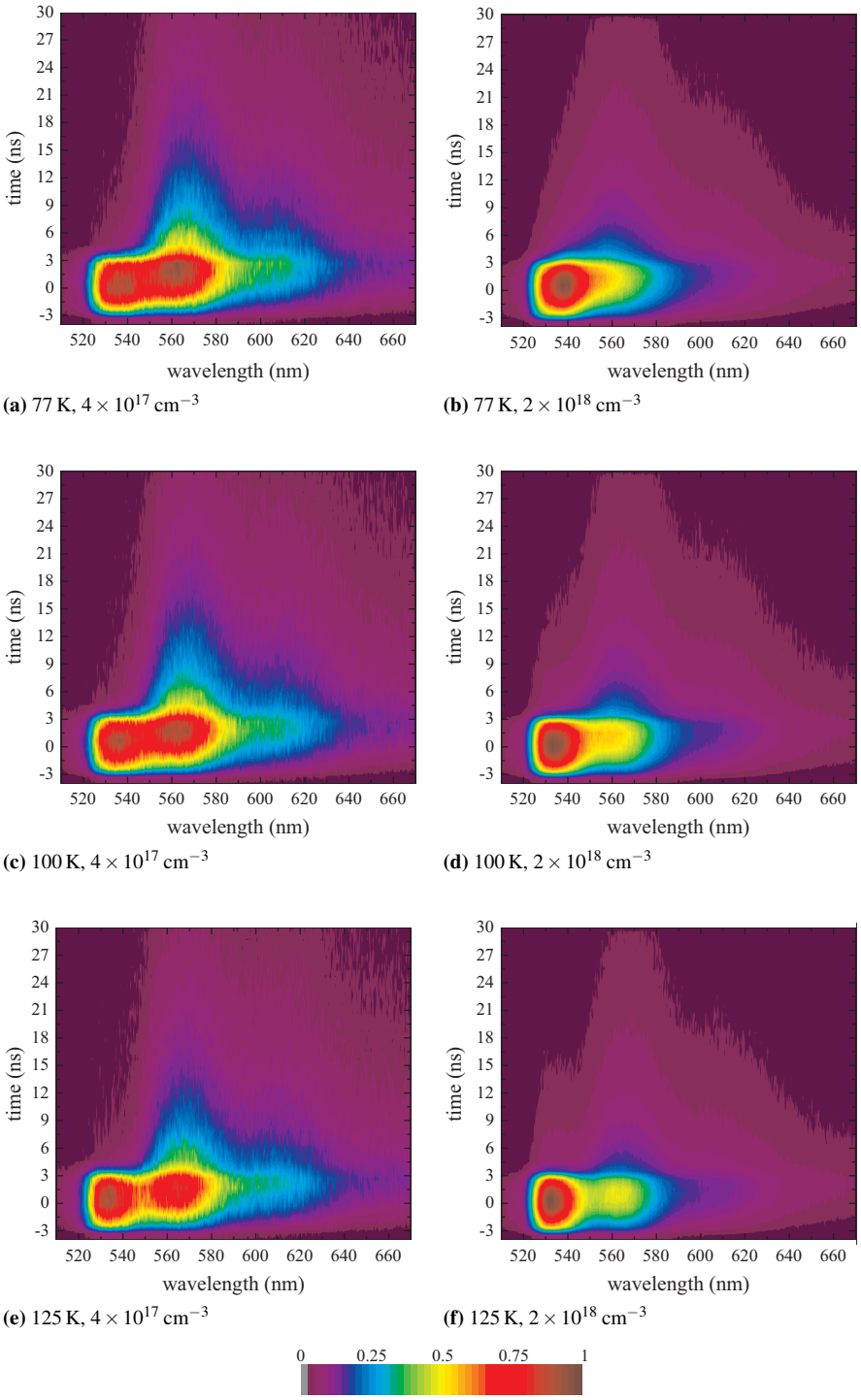


Fig. 3 Transients at 575 nm when various pump wavelengths were used. The power was adjusted according to the absorption spectrum in order to obtain an exciton density of approximately 2×10^{18} cm^{-3} in all experiments. This relatively high exciton density was required because a filter was used to omit the longest wavelength pump pulses (540 nm) from the transient data. The filter also reduced the intensity of the photoluminescence signal, and as such a greater exciton density was required in order for a reasonable signal to noise ratio to be achieved.



(a) 77 K, 4×10^{17} cm^{-3} **(b)** 77 K, 2×10^{18} cm^{-3}

(c) 100 K, 4×10^{17} cm^{-3} **(d)** 100 K, 2×10^{18} cm^{-3}

(e) 125 K, 4×10^{17} cm^{-3} **(f)** 125 K, 2×10^{18} cm^{-3}

Fig. 4 Contour plots of the normalized PL of Tc thin films as a function of time and wavelength conducted at 77 K, 100 K, and 125 K after excitation at 500 nm. The exciton density at which the experiments were conducted are also shown.

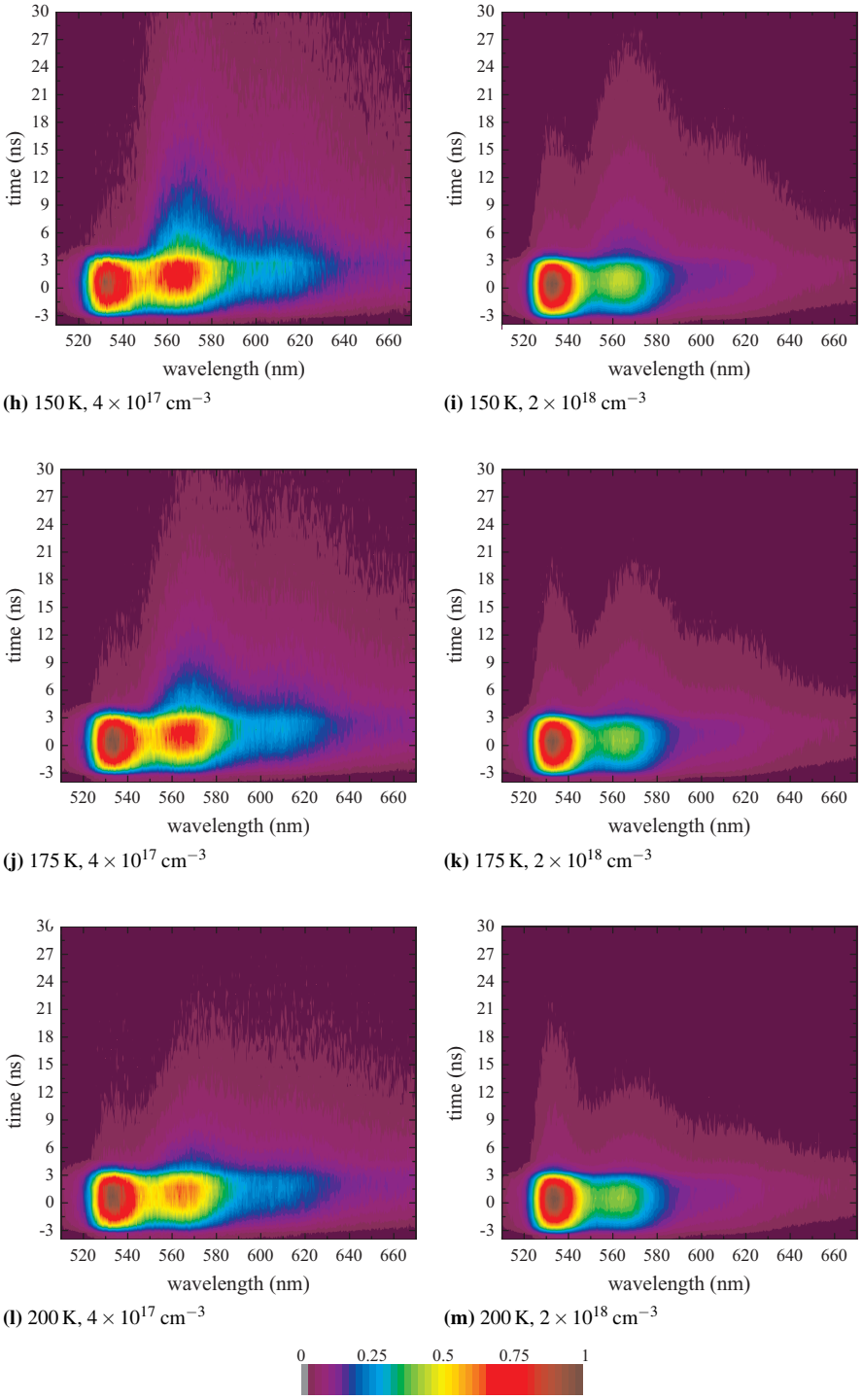


Fig. 4 Contour plots of the normalized PL of Tc thin films as a function of time and wavelength conducted at 150 K, 175 K, and 200 K after excitation at 500 nm. The exciton density at which the experiments were conducted are also shown.

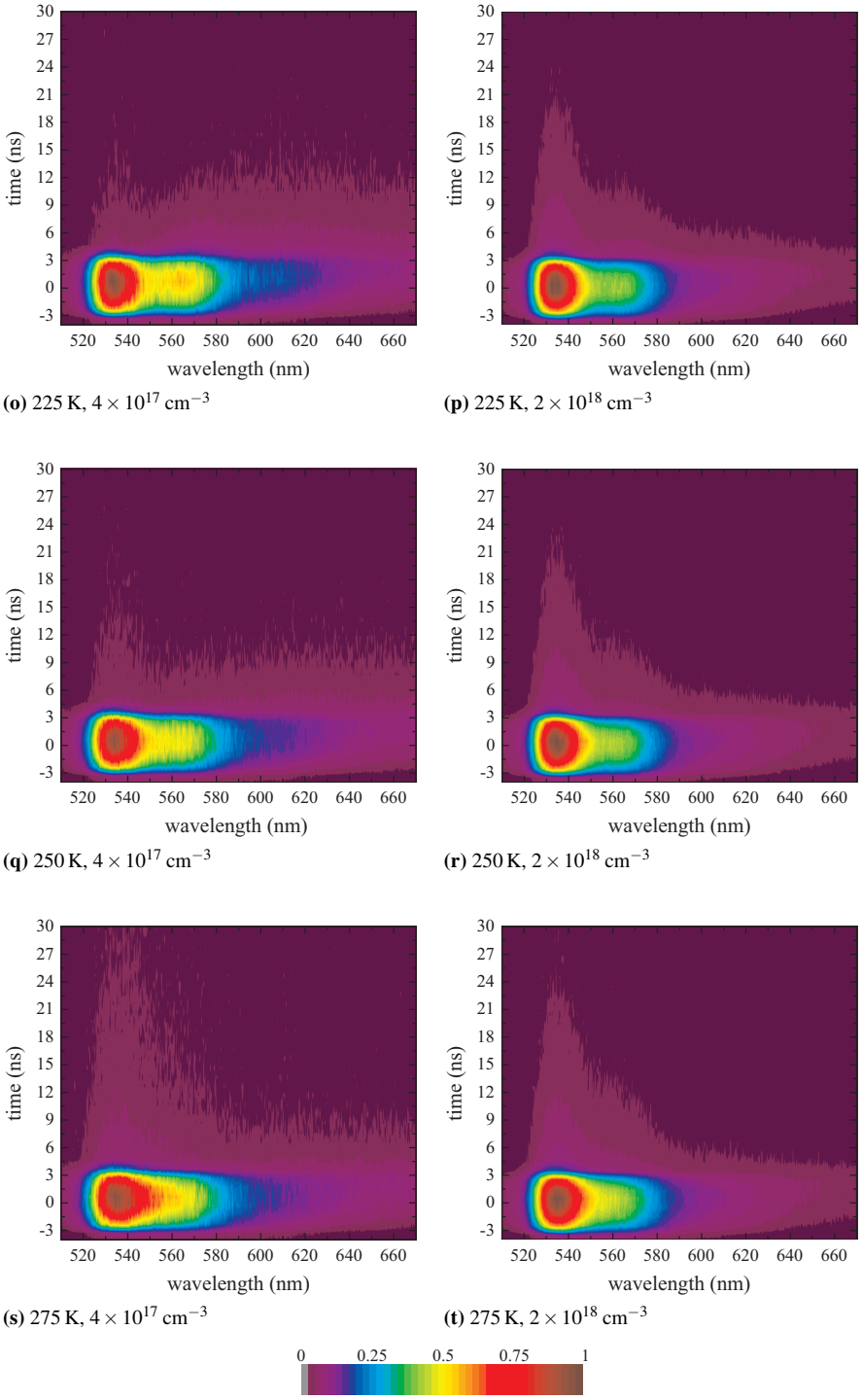


Fig. 4 Contour plots of the normalized PL of Tc thin films as a function of time and wavelength conducted at 225 K, 250 K, and 275 K after excitation at 500 nm. The exciton density at which the experiments were conducted are also shown.