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**Role of triplet polaron pairs in conjugated polymer photophysics**<sup>1</sup> ELIZABETH WESELY, University of Rochester Department of Physics, Rochester, NY 14623, LEWIS ROTHBERG, ALFRED MARCHETTI, University of Rochester Department of Chemistry, SHAW CHEN, YANHOU GENG, SEAN CULLIGAN, University of Rochester Department of Chemical Engineering — We measure the decay of the long-lived fluorescence of a conjugated oligofluorene at temperatures from 300 K to 20 K. We conclude that nearly all of this emission arises from geminate recombination of photogenerated polaron pairs to reform the singlet exciton, and that charge pair recombination represents a significant contribution to the overall fluorescence quantum yield. The unusual nonmonotonic decay dynamics of the delayed fluorescence can be explained if we assume interconversion between singlet and triplet polaron pairs on the submicrosecond time scale. ( $\sim 500$  ns.) We are able to model the decay of the delayed fluorescence by assuming activated recombination from a Gaussian energy distribution of singlet polaron pairs centered 0.2 eV below the excited state and having a standard deviation of 0.12 eV. The model is relevant to recent work involving the measurement of singlet-triplet branching ratios and to the yields of electroluminescent devices.

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Prefer Oral Session  
 Prefer Poster Session

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