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Probe single cyanine dye molecules' photo isomerization. ZIH-HAO CHEN, CHANG-YEH LEE, CHAO-KUEI LEE, YU-TSU CHUANG, JUI-HUNG HSU, National Sun Yat-sen University — Cyanine dyes are interested in the photosensitization, nonlinear optics, and their photophysical and photochemical behaviors. In particular, cyanine molecules, like DiI, plays an important role in single molecule fluorescence investigations. The high photo-stability, good QE, and low inter-system crossing rates, make it an good example for the single molecule investigations. We present the single molecule fluorescence investigation on the DiI molecules. In the investigation, we observe some (but not all) molecules exhibits reversible and quasi-stepwise polarization change. The decay dynamics is also changed correspondingly. Clear on-off blinking behaviors indicate the change in polarization from a single molecule, rather than the background noise, and we speculate it as the photo isomerization of the dye molecule. More detail analysis indicates some isomerization occurred at the singlet excited states, and it takes longer timescale (> ms) than expected.

Jui-Hung Hsu
National Sun Yat-sen University

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