TOWARDS SINGLE POLARIZED EMITTERS RECONSTRUCTION MICROSCOPY

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Nano-Ribbons (NR) formed by Self-Assembly of dialkoxy-*n*-acenes, organic fluorophores, are studied by fluorescence microscopy, aiming, among others, at elucidating the molecular packing in these 1D objects. Fluorescence microscopy offers correlative analysis between a multitude of derived techniques. On this purpose, a complete study [1] has been performed combining Confocal Microscopy (FLIM, Polarization of emission, Hyperspectral imaging) and Video-Microscopy (Polarization-Split Dual View, Single-Molecule imaging). Here we present the results obtained by video-microscopy and in particular by single molecule detection : When strongly exciting these NRs with 532nm laser light, which they do not absorb (they would be otherwise extremely fluorescent), we observed very bright and stable single emitters, nicely dispersed within/on the ribbons. Their fixed dipole orientations lead to recognizable PSF shapes (even in-focus) providing 3D orientation information [2,3]. A clear dependence between respective dipoles and NRs orientations was observed, suggesting that these emitters could be effective probes for the molecular packing in the NRs. Additionally, two polymorphs have been compared and gave strikingly distinct dependence laws of single emitters versus NR orientations. Perspectives include clarification of the nature of the emitters and development of analysis techniques to better and more quantitatively exploit the data.

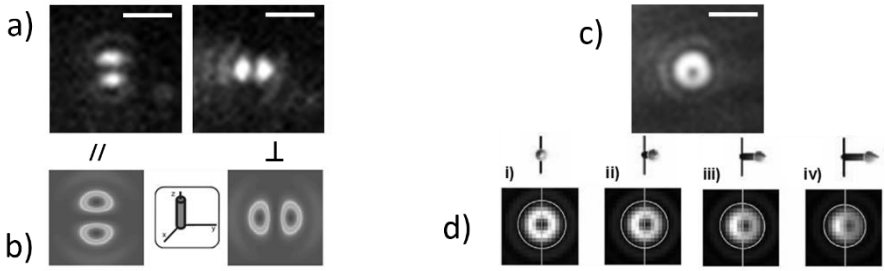

Figure 1: a) & c) Measured PSFs of single emitters strongly oriented along Z axis with, a), and without, c), polarization splitting. b) & d) Corresponding theoretical simulations of PSFs, reproduced from [2], b), and [3], c).

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[3] J. Enderlein, E. Toprak, P. R. Selvin," Polarization effect on position accuracy of fluorophore localization", *Opt. Express*, **14**, 8111–8120 (2006)