

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Combining DNA Nanotechnology and Fluorescence Polarization Microscopy to Determine the Orientation of DNA-bound Fluorophores
HUNTER BANKS, CHRISTOPH SCHNEIDER, DEBORAH FYGENSON, UC Santa Barbara — We describe a technique to measure the axis of the transition dipole moment of a fluorophore bound to dsDNA and compare results with existing techniques. We use DNA nanotubes to present the dsDNA in a known orientation and query a variety of intercalating (e.g., YO-YO, TO-TO), groove-binding (e.g. DAPI) or covalently linked (e.g., Fluorescein, Cy3, Cy5) dyes. A de Sénarmont prism in front of the camera generates simultaneous images of fluorescence polarized perpendicular and parallel to the DNA nanotube axis, allowing for ratio measurements that are insensitive to bleaching. We suggest the use of technique to detect helical supertwist, and possibly other nanoscale structural features, of DNA nanostructures.

Hunter Banks
UC Santa Barbara

Date submitted: 19 Nov 2010

Electronic form version 1.4