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**Simultaneous measurement of length, concentration and brightness of single-walled carbon nanotubes with fluorescence correlation spectroscopy** DENIS PRISTINSKI, CONSTANTINE KHRIPIN, XIAOMIN TU, MING ZHENG, NIST — We report on the application of fluorescence correlation spectroscopy (FCS) to simultaneously measure the brightness, concentration, and length of single-walled carbon nanotubes (SWCNTs). The technique relies on the intrinsic bandgap luminescence of (6,5) chirality semiconducting SWCNTs in the near infra-red (NIR) range and does not require sample labeling. The nanotubes used in this study have been dispersed in solution of single stranded DNA and length fractionated via size exclusion chromatography. The SWCNT length measured by FCS was in excellent agreement with more traditional techniques - polarized dynamic light scattering (DLS) and atomic force microscopy (AFM). The apparent nanotube brightness is shown to grow linearly with the mean nanotube length, having a zero intensity cut-off at 110 nm, implying an exciton diffusion length of 55 nm for SWCNTs dispersed in sodium deoxycholate.

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