



Contribution ID: 174

Type: Talk

【506】 Universal systematic polarization-dependent errors at the wavelength-scale for position measurements in super-resolution microscopy

Thursday 24 August 2017 12:00 (15 minutes)

Super-resolution-microscopy is a fast evolving field, revolutionizing traditional optical microscopy. These techniques enhance the precision of optical microscopy beyond the standard resolution limit and reach resolutions of a few nanometers. Here we show that, depending on the polarization of the light emitted by the observed particle, systematic wavelength-scale errors can occur when determining the particle's position using centroid-fitting techniques. The observed shifts are independent of the numerical-aperture or magnification of the imaging optics. We demonstrate this by imaging a single gold nano-particle with an optical microscope. We observe a shift of the particle's apparent position up to 0.4 wavelengths when varying the polarization of the light emitted by the nano-particle.

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Session Classification: Atomic Physics and Quantum Optics

Track Classification: Atomic Physics and Quantum Optics