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Polarization- and Angle-Resolved Cathodoluminescence Imaging Spectroscopy of Resonant Optical Nanostructures

Dielectric resonators at the nanoscale can exhibit complex interactions with light, controlling the wavelength, momentum and polarization of emission. Resolving all these three degrees of freedom at the nanoscale is not feasible for optical excitation techniques due to the intrinsic diffraction limit. As a technique circumventing this limit, cathodoluminescence (CL) imaging polarimetry, which uses an electron beam as excitation source, to achieve subwavelength spatial resolution is presented. The characterization of the emission from nanoscale silicon disc resonators by spatially and angularly resolved spectroscopic polarimetry allows to filter significant incoherent background radiation and to identify characteristics of electric and magnetic modes in resonators of different size.