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3D-Imaging of Non-spherical Silicon Nanoparticles Embedded in Silicon Oxide by Plasmon Tomography AYCAN YURTSEVER, School of Applied and Engineering Physics, Cornell University, Ithaca, NY 14850, MATTHEW WEYLAND, DAVID A. MULLER — We apply plasmon tomography to construct three-dimensional images of silicon nanoparticles in a silicon dioxide matrix, a materials system of interest for optical and storage devices, and at a level of detail and resolution not possible by conventional microscopies. We find that silicon particles with complex morphologies and high surface to volume ratios are dominant rather than the commonly assumed near-spherical structures. These results would affect quantum-confined excitons and interface density of states and, thus, the optical properties of this material. Our findings might explain some of the puzzles related with this material, including the broad photoluminescence band.

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