

**EFFECT OF SILICON AFM PROBE LOCATION ON ABSORPTION PROFILE OF
GOLD NANO-STRUCTURES ON A DIELECTRIC SURFACE**

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ABSTRACT. Effect of silicon (Si) atomic force microscope (AFM) probe position on the local absorption of gold nanoparticles (NPs) placed over a dielectric BK7 glass surface is evaluated. An improved, vectorized version of discrete dipole approximation coupled with surface interactions (DDA-SI-v), is employed throughout the study. It is shown that surface evanescent waves interacting with the system of NPs and AFM probe, resulting a near-field coupling between them. This coupling can enhance or reduce the local absorption by the NP depending on the position of AFM tip in 3D space, K-vector and electrical field of the surface evanescent wave. This concept can be used for selective heating of NPs placed over a surface that enables precision manufacturing at nanometer scales.