

Abstract Submitted
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Lateral quantization of two-dimensional electron states by embedded Ag nanocrystals¹ CHRIS VAN HAESENDONCK, KOEN SCHOUTEDEN, Laboratory of Solid-State Physics and Magnetism, KU Leuven, BE-3001 Leuven, Belgium — We show that quantization of image-potential state (IS) electrons *above* the surface of nanostructures can be experimentally achieved by Ag nanocrystals that appear as stacking fault tetrahedrons (SFTs) at Ag(111) surfaces. By means of cryogenic scanning tunneling spectroscopy the $n = 1$ IS of the Ag(111) surface is revealed to split up in discrete energy levels, which is accompanied by the formation of pronounced standing wave patterns that directly reflect the eigenstates of the SFT surface. The IS confinement behavior is compared to that of the surface state electrons *in* the SFT surface and can be directly linked to the particle-in-a-box model. ISs provide a novel playground for investigating quantum size effects and defect induced scattering *above* nanostructured surfaces.

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