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Size dependent thermalization time of Ag nanoparticles and the surface density profile CATALINA LOPEZ-BASTIDAS, Centro de Nanociencias y Nanotecnología , Universidad Nacional Autónoma de México, Ensenada, Baja California, México — It is well known that the lack of d-electron screening in the s-electron spill-out region at the surface of Ag nanoparticles increases the electron-electron interaction in this region compared to the bulk. Therefore when comparing the electron-electron interaction contribution to the thermalization time of Ag nanoparticles of varying radius, smaller particles thermalize faster due to the increased surface to bulk ratio. One aspect which has not been addressed is the effect of the spatial distribution of charge at the surface of the nanoparticle. In this work it is shown that the size dependence of the thermalization time is very sensitive to the surface density profile. The electron thermalization time of conduction electrons in Ag nanoparticles as a function of the radius is calculated. The sensitivity of the scattering rate to the spatial distribution of charge at the surface of the nanostructure is analyzed using several model surface profiles. The change in surface charge distribution via charging or coating of the nanospheres is shown to be a tool for control and probing of the ultra-fast electron-electron dynamics in metallic nanoparticles.

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