

In this work we propose a new way to describe the response of thin layers in terahertz SNOM (scanning near-field optical microscopy) experiments. In the first section, using the method of images we derive and verify formulae for the electric field of a dipole near a dielectric layer of finite thickness. We then compare the result with the well-known Point dipole model. In the second section, we first find the electric potential of a uniformly charged ring inside a dielectric layer, which we then use to derive a potential induced by a non-local response of the layer. Finally, we apply the Drude model to determine local conductivity, which lets us verify our result on the spectral dependence of the response of semiconductor nanostructures with homogeneous and inhomogeneous electron density.