

Quantum size effects manifest in infrared spectra of single bismuth nanowires

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Infrared transmission spectroscopy measurements on single bismuth nanowires of various diameters d are presented. The spectra show a strong absorption whose onset is blueshifted proportionally to $1/d^2$. We ascribe the absorption to interband transitions. The blueshift results from quantum size effects since they lead to the d -dependent splitting of the energy bands and to a respective shift of energy gaps.