

Abstract Submitted  
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**Far-infrared absorption of PbSe nanorods** BYUNG-RYOOL HYUN, ADAM BARTNIK, Cornell University, WEON-KYU KOH, University of Pennsylvania, NIKOLAY AGLADZE, JUN YANG, AL SIEVERS, Cornell University, CHRISTOPHER MURRAY, University of Pennsylvania, FRANK WISE, Cornell University, OPTICS COLLABORATION, SYNTHESIS COLLABORATION, SPECTROSCOPY COLLABORATION — The far-infrared absorption spectra of PbSe nanodots and nanorods are measured as a function of aspect ratio, and show the expected splitting of the single Frohlich sphere mode in nanocrystals into two modes parallel and perpendicular to the nanorod axis. We analyze this splitting by modeling the dependence of the nanocrystal's local field factor on its shape. Excellent agreements is found with the features measured in experiment. We predict that this shape-dependent local field factor will cause a two-order of magnitude increase of the third-order susceptibility of long nanorods in the near-infrared.

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