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**Effects of electron-phonon interactions on the electron tunneling spectrum of PbS quantum dots** A. ZIMMERS, H. WANG, E. LHUILLIER, Q. YU, A. MOTTAGHIZADEH, ESPCI-UPMC-CNRS Paris-France, C. ULYSSE, CNRS, Lab Photon Nanostruct, Marcoussis, France, A. DESCAMPS-MANDINE, B. DUBERTRET, H. AUBIN, ESPCI-UPMC-CNRS Paris-France — We present a tunnel spectroscopy study of single PbS and HgSe quantum dots (QDs) as a function of temperature and gate voltage. The samples are fabricated through high-vacuum projection of the QDs on the chip circuit. For PbS, three distinct signatures of strong electron-phonon coupling are observed in the electron tunneling spectrum (ETS) of these QDs. In the shell-filling regime, the 8x degeneracy of the electronic levels is lifted by the Coulomb interactions and allows the observation of phonon subbands that result from the emission of optical phonons. At low bias, a gap is observed in the ETS that cannot be closed with the gate voltage, which is a distinguishing feature of the Franck-Condon blockade. From the data, a Huang-Rhys factor in the range S similar to 1.7-2.5 is obtained. Finally, in the shell-tunneling regime, the optical phonons appear in the inelastic ETS d(2)I/dV(2). For HgSe, the data show that the inter-band and intra-band gap can be clearly identified in the ETS.

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