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Interlevel optical properties of quantum dots: some unexpected problems and their solutions VICTOR BONDARENKO, WSU — Optical properties of quantum dot (QD) systems due to interlevel transitions of electrons in the dots are investigated. Electron-electron interaction in the QD systems is in the focus of the consideration. We show how the problem of electron self-interaction appears in QDs and how to solve it. We present convenient tools for handling the electron-electron interactions in QDs. Principal importance of careful consideration of QD shape and polarization direction of incident radiation for correct interpretation and prediction of the optical properties of QDs is shown. Some fundamental aspects of the electromagnetic response of QDs are revealed which is important for designing, manufacturing, and exploiting nanooptoelectronic devices based on QDs.

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