

Bound states in the continuum in cuprous oxide quantum wells

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Abstract

We propose a realistic semiconductor system containing bound states in the continuum (BICs) which allows for a practical realization. By varying the confinement strength of excitons in cuprous oxide quantum wells, we show that the long-lived Rydberg states of the confined electron-hole pairs appear in the continuum background. The accuracy of calculations of the linewidths based on the coupled-channel Schrödinger equation with three channels is confirmed by a numerically exact solution employing a B-spline basis and the complex-coordinate-rotation method. We argue that finite-sized cuprous oxide crystals, due to their large exciton binding energies, are a convenient platform for experimental identification of BICs.