Place in a session on general quantum systems

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

**A quantum particle in a high-symmetry two-dimensional box** MAXIMILLIAAN KOOPMAN, ANDREW DAVIS, QING WANG, ANTONETT NUNEZDELPRADO, CONSTANCE DOTY, TRISTAN REYNOSO, RICHARD KLEMM, Univ of Central Florida — We present contour-plot representations of the low-energy wave functions for a quantum particle in a two-dimensional infinite well potential exhibiting perfect $C_\infty$ (disk), $C_{2v}$, (rectangular), $C_{3v}$ (equilateral triangular), or $C_{4v}$ (square) point group symmetry. The rotationally-invariant $C_\infty$-allowed wave functions have the integer quantum numbers $n \geq 1$. For the rectangular box, all wave functions with $n, n' \geq 1$ are allowed, and each one is an allowed representation of the $C_{2v}$ point group. However, for the equilateral-triangular and square boxes, some quantum numbers have to be eliminated, as the wave functions to which they correspond cannot be made into representations of the respective $C_{3v}$ or $C_{4v}$ point groups. For the equilateral triangular box, only $|n-n'| = 3p$ are allowed, where $p \geq 0$ for the wave functions even about the three mirror planes, and $p \geq 1$ for wave functions odd about the three mirror planes. For the square box, $|n - n'| = 2p$ are allowed, where for $p \neq 0$, only the sum and difference of the two degenerate wave functions are representations of the $C_{4v}$ point group.

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Date submitted: 12 Dec 2016 Electronic form version 1.4