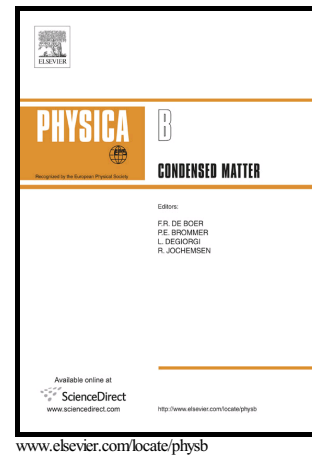


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Nonlinear optical rectification in spherical dome semiconductor nanoshells

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Abstract: For spherical semiconductor nanoshells, nonlinear optical rectification is suppressed due to their spherical symmetry. Here, we design a structure, called spherical dome semiconductor nanoshells, to realize nonlinear optical rectification. Numerical energy levels and wave functions are applied to the calculation of nonlinear optical rectification in this structure. We discuss the dependence of nonlinear optical rectification on the cut-off angle and the inner and external radius. Our results show that with the increase of the cut-off angle, the magnitude of nonlinear optical rectification increases and its resonant peak doesn't shift. Through the modulation of the inner and external radius, the resonant peak of optical rectification can be tuned effectively. This structure holds great potential for the development of optoelectronic devices such as optical modulators and photodetectors.

Keywords: Dome Semiconductor Nanoshells; Optical Rectification; Cut-off Angle

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