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Shift- and injection-current optical response of BN nanotubes<sup>1</sup> NORBERTO ARZATE, Centro de Investigaciones en Optica, Mexico, FRED NAS-TOS, Department of Physics, University of Toronto, RAUL A. VAZQUEZ-NAVA, Centro de Investigaciones en Optica, Mexico, MIGUEL GONZALEZ, Centro Universitario de los Lagos, Mexico., BERNARDO MENDOZA, Centro de Investigaciones en Optica, Mexico, JOHN SIPE, Department of Physics, University of Toronto -We present the frequency dependence of the electrical shift and injection currents optically generated on BN nanotubes. The shift and injection currents are a second order effect that is associated to a divergence of the nonlinear susceptibility at zero frequency. The shift current is generated with linearly polarized light and the injection current can be generated with circularly polarized light. We make use of density functional theory and pseudopotentials to calculate the nanotube structures and their electronic states. The current-coefficient calculations are done in optical rectification, within the independent particle approximation and within a full band structure scheme. We also obtain the frequency dependence for the shift distance that the center of electron charge moves in the shift-current process and for the swarm velocity or maximum velocity acquired by the electrons in the injection process.

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