Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Resonance Raman investigation of monolayer and bilayer graphene MARCOS PIMENTA, LEANDRO MALARD, DANIELA MAFRA, JULIANA BRANT, DANIEL ELIAS, Departamento de Fisica, UFMG, Brazil, GEORGII SAMSONIDZE, Berkeley University, JOHAN NILSSON, ANTONIO CASTRO NETO, Boston University, FLAVIO PLENTZ, ELMO ALVES, Departamento de Fisica, UFMG, Brazil — The Raman spectra of graphene samples exhibit a band around 2700 cm^{-1}, the so called G$'$ band, that is ascribed to a double resonance Raman process involving electrons and phonons in the vicinity of the Dirac point. A dispersive behavior in the position and shape of this band is observed when we change the laser energy used in the Raman experiment, showing that it can be used to probe experimentally the dispersion of electrons and phonons near the Dirac point of graphene. We will present a resonance Raman investigation of monolayer and bilayer graphene using many different laser lines in the visible and near IR range. By the analysis of the dispersive behavior of the G$'$ band we can obtain information about the electronic structure of monolayer and bilayer graphene, such as the intralayer and interlayer tight-binding parameters. Our results reveals a significant asymmetry between the electronic dispersion in the valence and conduction bands of bilayer graphene. We are also able to obtain experimental values for the velocity of the TO and LA phonons near the Dirac point of graphene.

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Date submitted: 23 Nov 2007 Electronic form version 1.4