

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Strain effects in polytypical wurtzite/zinc-blend nanowhiskers¹

GUILHERME SIPAHI, PAULO FARIA, Instituto de Fisica de Sao Carlos - Universidade de Sao Paulo — The recent interest on III-V nanowhiskers has led to the growth of high quality samples of systems with two different crystalline structures [1]. The crystals grown in [111]-direction for the zinc-blend (ZB) phase and [0001]-direction for the wurtzite (WZ) phase are very similar and can both be described as stacked hexagonal layers. The effect of two different structural phases coexisting in the same nanostructure is known as polytypism and creates confinement profiles similar to a heterostructure. One can notice band offsets at the interface and the formation of electronic minibands that can be explored to design systems for device applications. Although some of the III-V compounds do not present WZ structure in bulk form, recent calculations [2] presented a theoretical prediction of their band structure. However, as they considered that ZB and WZ to have the same lattice parameters no strain effects should appear on a first approach. Our theoretical approach introduces strain effects in our previous model [3] by using group theory arguments. It allows the analysis of the biaxial strain effects for both structures in a single matrix. [1] P. Caroff et al. Nature Nanotech. 4, 50, 2009. [2] A. De and C. E. Pryor, Phys. Rev. B 81, 155210, 2010 [3] <http://arxiv.org/abs/1012.022>

¹The users would like to acknowledge the support from Capes, CNPq and FAPESP (brazilian funding agencies)

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Date submitted: 11 Nov 2011

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