



СОФИЙСКИ УНИВЕРСИТЕТ
ФИЗИЧЕСКИ ФАКУЛТЕТ

ФАКУЛТЕТЕН СЕМИНАР

сряда, 25.04.2018 г., 16:15 ч., зала А415

Dr. Filip Krzyżewski

Institute of Physics, Polish Academy of Sciences, Warsaw, Poland

Numerical study of various surface morphologies with reference to the sloped GaN(000-1) plane

I will present variety of surface patterns obtained during atomistic simulations of vicinal crystal surfaces. At first numerical results of GaN vicinal N-plane will be shown. The study was inspired by results of experiments for plasma assisted MBE grown N-polar GaN layers. It was observed that, in contrast to typical behaviour, the meander wavelength increases with increasing terrace width and flux of deposited Ga. Usually expected behaviour is opposite i.e. under higher fluxes waves are longer. We observe such dependence in the case of N-flux. To explain the existence of two different trends in meander formation we apply step edge barrier dependent on Ga adatoms density. I will also present a variety of other surface morphologies [1,2] obtained at different growth condition and show stability diagrams presenting those patterns in the space of crucial simulation parameters. Finally I will concentrate on the step bunching phenomenon [3-5]. I will present 1D model of vicinal surface and discuss its stability against step bunching. I will show range of simulation parameters where step bunching is present independently on the direction of diffusional bias.

References:

- [1] F. Krzyżewski and M. Załuska-Kotur J. Cryst. Growth 457, 80-84 (2017)
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- [3] A. Krasteva, H. Popova, F. Krzyżewski, M. Załuska-Kotur, and V. Tonchev, AIP Conf. Proc. 1722, 220014 (2016)
- [4] F. Krzyżewski, M. Załuska-Kotur, A. Krasteva, H. Popova, and V. Tonchev, J. Cryst. Growth 474, 135 (2017)
- [5] O. Toktarbaiuly et. al. Phys. Rev. B 97, 035436 (2018)



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