# NANORIPPLES PRODUCTION ON SILICON AND GERMANIUM SURFACES UNDER ARGON IRRADIATION

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Ion beams are frequently used in industry for composition control of different materials as well as thin film deposition. It was noticed that low- and medium- energy ions at high fluencies may produce nanoripples and quantum dots on the irradiated surfaces. In the present work we focus our attention on the study of simulated irradiation of amorphous silicon (a-Si) and amorphous germanium (a-Ge) samples with 1 keV Ar ions under different angles, taking into special consideration angles close to the grazing incidence. Moreover, sequential 1 keV Ar irradiation is done in order to see the evolution of the surface.

This study has been carried out with Molecular Dynamics (MD), which provides tools to measure the stress generated in the simulation cell as well as the total displacement of the particles which compound the cell. MD results are compared with the results obtained using the Binary Collisions Approximation (BCA), following the previous work on this matter [1]. The results are subsequently analyzed with the numerical module Pycraters [2], which allows the prediction of the ripple wavelength. The calculated wavelength can be directly compared with the experimental observations.

[1] Scott Norris, Juha Samela, Laura Bukonte, Marie Backman, Flyura Djurabekova, Kai Nordlund, Charbel S. Madi, Michael P. Brenner & Michael Aziz, Nature Communications 2, 276 (2011)

[2] Scott Norris, arXiv:1410.8489 [physics.comp-ph]