

# Nanostructured surfaces

## Stochastic model of stationary patterns formation during ion sputtering.

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We study pattern formation processes on the surface during ion sputtering using the Kuramoto-Sivashinsky equation with multiplicative noise and stabilizing parameter. This equation is a generalization of the Bradley – Harper model [1] for ripple formation induced by incident ion beam. We assume that the angle of incidence is stochastic and distributed in space and time.

In current work we analyze the character of stationary pattern formation on the surface according to main system parameters. For our system those are ion incidence angle and target properties, such as penetration depth. During linear stability were found regions for the main system parameter where pattern formation is possible. The structure formation dynamics for different level of stochastic source influence was obtained. We found scaling behavior of the surface growth and roughness characteristics. Was analyzed the surface defects dynamics for different fluctuation values. All counts was made if a framework of numerical methods.

1. *R. M. Bradley and J. M. E. Harper, J. Theory of Ripple Topography Induced by Ion Bombardment//Vac. Sci. Technol.-1988.- A 6.- 2390.*
2. *D. O. Kharchenko, V. O. Kharchenko, I. O. Lysenko et al.,. Stochastic effects at ripple formation processes in anisotropic systems with multiplicative noise // Phys. Rev. E.-2010.-82.-P. 061108.*