Kinetic Monte Carlo Simulations for Epitaxial Growth of Thin Films

by Mr Guo Junyan

Date: 09 February (Thursday)
Time: 12:00pm to 12:30 pm
Venue: LT 3

Abstract

Understanding the dynamics of the growing surface and controlling the surface morphologic evolution of epitaxially grown thin films is of great importance to achieve high quality electronic performance. However, epitaxial thin-film growth is a complicated phenomenon involving various atomic processes such as deposition, nucleation, desorption and diffusion of adatoms. To this end, a three-dimensional (2+1), atomistic, kinetic Monte Carlo code is developed with all afore-mentioned atomic processes and the Ehrlich-Schwoebel barrier (ESB) implemented. Computer simulations are thus carried out to investigate the surface morphological evolution during multilayer epitaxial growth of thin films. These simulation results may help identify suitable experimental parameters and explain certain observations for researchers devoted to doing relevant experiments.

Mr Guo Junyan obtained his B.Eng degree at the Department of Engineering Physics, Tsinghua University, Beijing and his M.Eng degree at the Division of Engineering Mechanics, School of Mechanical and Aerospace Engineering, NTU. Since year 2000 he has been working as a senior research engineer with the Institute of High Performance Computing (IHPC). His main duties focus on conducting research and consultation work associated with computational solid mechanics for various industries such as electronics, defense, and marine & offshore engineering. He is currently pursuing his PhD study on a part-time basis under supervision of Dr. Zhang Yong-Wei and Dr. Lu Chun.