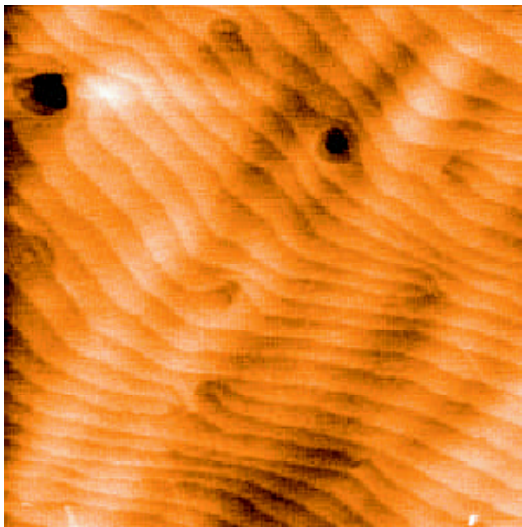


Screw dislocations in GaN

Nanosurf® - Application Note No. 00164

Gallium nitride features some unique properties [1] such as large band gap, strong interatomic bonds, and high thermal conductivity. Along the last decade, GaN has attracted great interests owing to its potential applications in high power and high frequency electronic devices [2] as well as in blue LED devices [3]. GaN layers are usually grown by Metal Organic Chemical Vapor Deposition and the Molecular Beam Epitaxy methods.



*GaN, different sample preparation conditions.
Image size 5x5 um, Z-range 1.5 nm*

Sapphire is now the most commonly used substrate although of its highly mismatched lattice and thermal expansion coefficients. As a consequence, the obtained GaN layers often contain a large number of defects [4], mainly dislocations.

The image shows a piece of GaN with steps and screw dislocations (holes). The goal is to count the number of dislocations and step distribution.

Sample courtesy: Dr Rachel Oliver, The Cambridge Centre for Gallium Nitride, Department of Materials Science and Metallurgy, University of Cambridge.

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Application domain: Coating
Material Science
Physics
New Material