

HL 45 Invited Talk Koenraad

Time: Thursday 14:30–15:15

Room: HSZ 01

Invited Talk

HL 45.1 Thu 14:30 HSZ 01

Atomic scale analysis of magnetic doping atoms and self-assembled III/V semiconductor nanostructures — •P.M. KOENRAAD — COBRA Inter-University Research Institute, Department of Physics, Eindhoven University of Physics, P.O. Box 513, 5600 MB Eindhoven, The Netherlands

In the last decade we have seen the successful development of self-assembling growth techniques to produce a whole range of low-dimensional III/V semiconductor nanostructures such as wires, dots, rings and columns. Structural analysis at the atomic scale of these nanostructures is essential for the study of the self-assembly and self-organization processes forming them. For cross-sectional scanning tunnelling microscopy (X-STM) a sample is cleaved under ultra-high vacuum conditions. This cleaved surface reveals a cross-sectional image of the grown layer structure. As the STM is only sensitive to the top layers of the cleaved surface we can resolve alloy fluctuations, interfaces, doping atoms, segregation effects, etc. Using cross-sectional STM we have studied the size, shape and local composition in III/V quantum wires, dots, rings and columns that have formed by self-assembly and self-organization. Special attention will be paid to intermixing, decomposition, segregation and migration of the nanostructure material during the formation process. We have also been able to study the incorporation and segregation of (magnetic) doping atoms. Very recently we have been able to analyze impurity interaction in pairs of doping atoms.