

Title : Phase field approximation for VLS growth of nanowires

by

Elie Bretin (elie.bretin@insa-lyon.fr)

Abstract: Nanowires have been intensively studied in recent years because of their potential as basic building blocks in the fields of nanoelectronics, magnetism, photonics or energy. Although it is currently possible to manufacture nanowires, the physical mechanisms that govern the growth (nucleation, diffusion, role of catalyst, ...) and the control of nanowires parameters (crystallography, defects, morphology, ...) are still not completely understood.

In order to better understand these physical mechanisms, we propose in this work a quasi-static modeling of the nanowires growth which conduces to some muliphase systems evolving by anisotropic mean curvature flow with hight contrasted mobilities. We then explain how to approximate these mutiphase systems using a phase field method. The main novelty here is in the treatment of the mobility and the anisotropy.