

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Modulated spinodal decomposition in (Ge,Mn) films grown on GaAs(001) MATTHIEU JAMET, ING-SONG YU, THIBAUT DEVILLERS, ANDRÉ BARSKI, PASCALE BAYLE-GUILLEMAUD, CYRILLE BEIGNÉ, VINCENT BALTZ, INAC, CEA-UJF, 17 rue des Martyrs, 38054 Grenoble, France, JOEL CIBERT, Institut Néel, CNRS-UJF, 25 rue des Martyrs, 38042 Grenoble, France — The field of ferromagnetic semiconductors evolves very fast nowadays for their potential use in spintronic devices. Up to now, efforts have mainly focused on Diluted Magnetic Semiconductors but Curie temperatures in these materials still remain modest. One possible route to increase at least locally transition temperatures is to use spinodal decomposition leading to transition metal-rich high T_C nanostructures. We focus here on (Ge,Mn) considered as a model system for spinodal decomposition and compatible with Si-based microelectronics. While the growth of (Ge,Mn) films on Ge substrates leads systematically to Mn-rich self-assembled nanocolumns exhibiting high T_C , we demonstrate the fine control of spinodal decomposition in (Ge,Mn) films grown on GaAs. Using different surface preparations, we clearly identify the role of surface morphology and impurity diffusion from the substrate (Ga or As) on the nanocolumns growth and the electrical properties (MR and AHE).

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Date submitted: 29 Dec 2009

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