

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Annealing studies of ion-beam irradiated GaMnAs thin films SE-GIO L.A. MELLO, M.M. SANT'ANNA, C.F.S. CODEÇO, Universidade Federal do Rio de Janeiro, Brazil, S. DONG, T. YOO, X. LI, X. LIU, J.K. FURDYNA, University of Notre Dame — We have studied the effect of ion-beam irradiation on GaMnAs films by means of systematic transport and magnetization measurements. Both the magnetization and the conductivity of such samples decrease as a result of increase of disorder and defects in the system caused by the irradiation process. In this study we investigate the recovery of such irradiated samples, by measuring their magnetization and transport properties before and after annealing. Our preliminary transport measurements on annealed-irradiated samples show significant enhancement of the transport properties of the films (revealed by the increase of conductivity and of the critical temperature). Samples comparison of resistivity curves $\rho(T)$ of annealed-irradiated and annealed-non-irradiated samples indicates that most defects created by low fluences of ion beams are similar to those created while growing the samples. This is evidenced by the fact that low ion-fluence irradiation $\rho(T)$ curves of annealed-irradiated and annealed-non-irradiated samples nearly match. For high ion-fluence, however, the sample properties cannot be fully recovered by annealing. This suggests that the nature of a minor fraction of irradiation-created defects is different from those created during sample growth.

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Date submitted: 14 Nov 2014

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