Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

The magnetic behaviour of diluted (Ga,Mn)N ALBERTA BONANNI, BOGDAN FAINA, TIAN LI, ANDREA NAVARRO-QUEZADA, ANDREAS GROIS, THIBAUT DEVILLERS, Johannes Kepler University, Linz, Austria, WIKTOR STEFANOWICZ, DARIUSZ SZTENKIEL, MACIEJ SAWICKI, TOMASZ DIETL, Polish Academy of Sciences, Warsaw, Poland — We report on the magnetic properties of MOVPE (Ga,Mn)N films characterized by TEM, EDS, synchrotron -XRD and -EXAFS, SIMS, Raman and PL. In contrast to our previously studied (Ga,Fe)N [1], no decomposition is found in the Mn-doped samples in the concentration range to $x = 1$ %. Accordingly, the magnetization measured up to 6 T and down to 2 K for two orientations of the magnetic field can be quantitatively described by assuming more than 95% of Mn to be in the 3+ state, with no evidence for interactions between the Mn spins. Furthermore, we have fabricated modulation doped (Ga,Mn)N/(Al,Ga)N:Mg multilayers accurately replicating the design of the structures in which indications of ferromagnetism characterized by above room temperature T_C and large spontaneous magnetization, have been recently reported [2]. Our data do not reproduce those observations.

[1] A. Bonanni et al., Phys. Rev. B 75, 125210 (2007); Phys. Rev. Lett. 101, 135502 (2008); Phys. Rev. B. 79, 195209 (2009).
[2] N. Nepal et al., Appl. Phys. Lett. 94, 132505 (2009).

Alberta Bonanni
Johannes Kepler University, Linz, Austria

Date submitted: 16 Nov 2009 Electronic form version 1.4