

## Effect of Si substitution on the local magnetic properties of the $Mn_5(Ge_{1-x}Si_x)_3$ /Ge(111) epitaxial films



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... line

Si does not change significantly the anisotropy of Hyperfine Field

Orbital moment :  $\Delta \mu^{\perp} = (\mu^{\perp})_{\parallel} - (\mu^{\perp})_{\perp}$ No significant effect of Si on the Mn orbital m

Mn<sub>5</sub>(Ge<sub>0.5</sub>Si<sub>0.4</sub>)<sub>3</sub> v =216.37-10.25 \*B<sub>0.1</sub>

In-plane magnetic saturation ≈ 0.5T - very close to that in Mn5Ge3

0.5 1.0 1.5 2.0 2.5 3.0 3

B<sub>est</sub> > 1T – monotonous frequency downshift of all NMR lines, including Mn<sub>ilnew</sub> magnetic moments are parallel and ferromagnetically counted

, line reveals a new magnetion ant in some of the 6(g) sites

- The onset of the low-moment Mn<sub>t/new</sub> environments at the expense The offset of the semiclicity many memory methods and the opposite of pristine Mn<sub>n</sub> is reflected in a progressive drop of the average saturation magnetic moment with increasing SI concentration and can be attributed to a mixing of the 3d electron states of Mn with the 3p electron states of SI atoms.
- Coexistence of  $Mn_{II}$  and  $Mn_{IIncov}$  environments in the mixed concentration region, indicates that a transition from the FM order for x = 0 to AF1 structure for x = 1 represents a first order phase transition