Spin Glass Dynamics: Finite Size Effects SAMARESH GUCHHAIT,
RAYMOND ORBACH, The University of Texas at Austin — Because the spin glass
lower critical dimension $2 < d_l < 3$, the nature of spin glass dynamics changes at the
crossover time t_{co} when the spin glass correlation length $\xi(t_{co}, T)$ equals the mini-
mum characteristic sample length ℓ. For times $t < t_{co}$, one observes conventional
three dimensional spin glass dynamics. For $t > t_{co}$, spin glass dynamics cross over
to two-dimensional behavior. However, even for $t > t_{co}$, there remain correlated
spin glass states for which $\xi(t, T) < \ell$, but with a maximum barrier height Δ_{max}.
Furthermore, because of ultrametricity, the number of states separated by Δ_{max}
is exponentially large. This leads to activated dynamics controlling the time de-
pendence of the zero field cooled and thermoremanent magnetization near the glass
transition temperature. We have measured these phenomena in films of a-Ge:Mn,
and obtained quantitative results for (the related) t_{co} and Δ_{max}. These states are
also responsible for the frequency dependence of the dynamic susceptibility $\chi(t)$
of Cu:Mn thin film sandwiches previously measured by Sandlung *et al.* We show
that the spin glass temperature remains at the bulk T_g, and that the temperature
dependence of $\chi(t)$ is a consequence of Δ_{max}.

Samaresh Guchhait
Univ of Texas, Austin