

Recalling Dr. Miguel Ocio

Close French-Japanese Relationship

Slow Dynamics in Spin glasses

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Miguel in Close French-Japanese Relationship

1980's Hokkaido Univ. Contact through Prof. Miyako

1988 Kyoto Univ. 2nd Yukawa International Symposium on
"Cooperative Dynamics in Complex Physical Systems"

1994 ~ 96, 96 ~ 98, 98 ~ 2000

Monbu-sho International Cooperative Research Projects
(France, US, Japan)

"Transition and Dynamics in Complex Systems", "....."

Miguel was a representative member from Saclay.

workshops: '94 Tsukuba '95 Saclay-Orme des Merisiers
'96 Lake Arrowhead '97 Kyoto
'98 Abbey Royaumont '99 Kyoto

2004 Jan. French-Japanese Bilateral Seminar on

"Frustrated Spin systems", organized by H. Kawamura

Miguel was invited and planned to come, but he could not.

2005 Sept. French-Japanese Bilateral Seminar on

"Recent Progress in Glassy Physics", organized by L. Cugliandolo

Let us further strengthen the F-J and Euro-J relationships Miguel left us.



**2nd Yukawa International Symposium on
"Cooperative Dynamics in Complex Physical Systems", Kyoto, 1988**

Miguel stimulated me much in research on slow dynamics in spin glasses

Title of Miguel's talk in 2nd YKIS

*"Experimental Study of the Slow Dynamics
in the Spin-Glass Phase"*

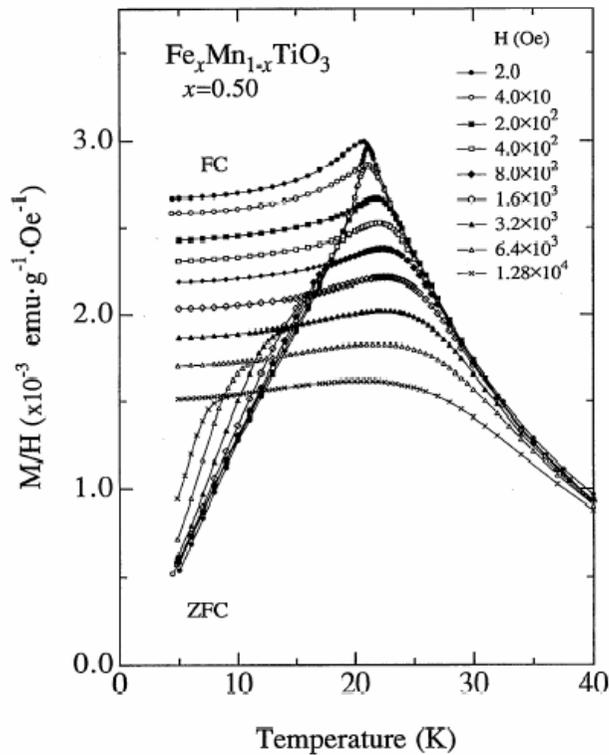
Title of my research in these more than a decade has been

*"**Numerical** Study of the Slow Dynamics
in the Spin-Glass Phase"*

and I have been struggling on the relation between experimental
and numerical results.

Semi-Quantitative Comparison between Experimental and Numerical Results

Deviation of ZFCM from FCM in Ising SG $\text{Fe}_{0.5}\text{Mn}_{0.5}\text{TiO}_3$



Aruga-Ito ('94)

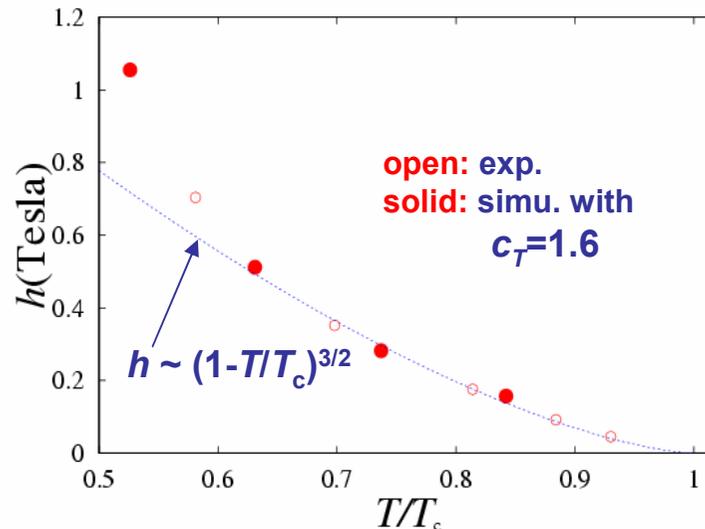
Evidence for the AT Phase Transition

From numerical simulation of field-shift aging protocols on the 3D Gaussian Ising EA model, we have recently reached to

dynamical crossover scenario

for the protocols as well as for the deviation of ZFCM from FCM represented by

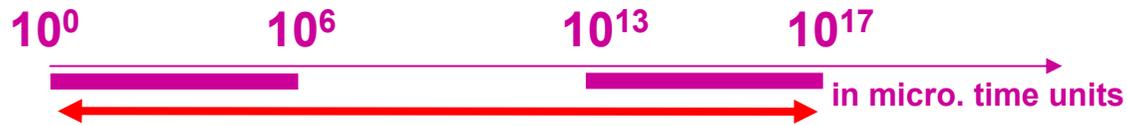
$$h[\text{Tesla}] = C_T T_c [\text{K}] (t_w^{\text{cr}} / t_0)^{-1/\delta z} (T/T_c)$$



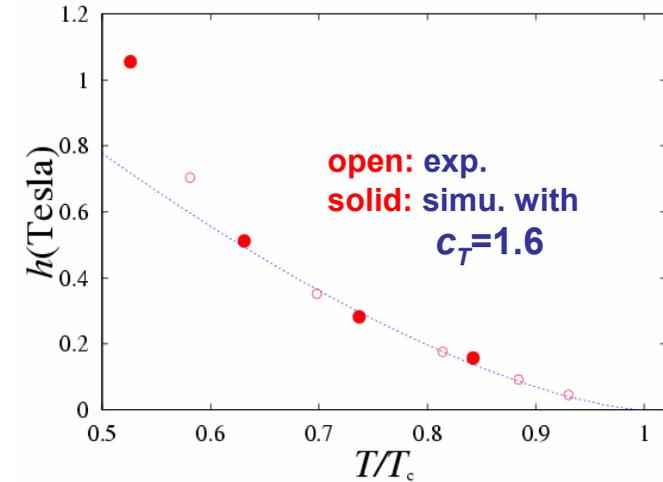
$$T_c = 21.5 \text{ K}$$

$$t_0 \approx 10^{-12} \text{ s}$$

$$t_w^{\text{cr}} = t_{\text{obs}} \approx 10^2 \text{ s}$$



This result is, to our knowledge, the **first semi-quantitative agreement of the numerical result with the experimental one** that we have observed on the slow dynamics in spin glasses.



What comment Miguel would give me on this?

Do further continue

Numerical Experiments (numerical simulation based on a model as microscopic (realistic) as possible)

to properly understand

“glassy dynamics” (slow dynamics of a cooperative origin + thermal blocking)

in ***spin glasses (complex systems)***.