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Probing the spin-dynamics in reentrant spin-glass phase with giant magnetoimpedance[1] F.L.A. MACHADO, P.R.T. RIBEIRO, S.M. REZENDE, Departamento de Fisica, UFPE, 50670-901 Recife-PE, Brazil, E. DAN DAHLBERG, School of Physics and Astronomy, UMN, Minneapolis, MN 55455, USA — In a relatively narrow concentration range amorphous FeZr alloys undergo a phase transition from a ferromagnet state to a spin-glass phase at low temperatures. To investigate the high frequency dynamics of this reentrant transition we have used measurements of the giant magnetoimpedance (GMI). In general the GMI is a measurement of the transverse magnetic permeability, μ_T, as a function of temperature, T, and frequency, f, through their relation to the skin-depth δ $(= [\rho/\pi f \mu_T]^{1/2})$. In our recent work [Appl. Phys. Lett. 109, 102404 (2016)], the GMI was used to explore the relation between the scaling-law of the relaxation time,τ, $(\tau = 1/f)$ and the reduced freezing temperature $(t = 1 - T_f/T_G)$ in the MHz f-regime for a $Fe_{90}Zr_{10}$ sample with a T_G of 14.0 K. We will review this work and present GMI and χ_{ac} data for a $Fe_{91}Zr_9$ sample with T_G equal to 38.4 K. For the $Fe_{91}Zr_9$ sample it was found that the product of the critical exponents $z\nu$ $(= 7.8)$ is comparable to the $Fe_{90}Zr_{10}$ sample $(= 7.4)$ despite the different values of T_G. We conclude the alloys belong to the short-range Ising class of universality up to the MHz f-regime.

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