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Aging dynamics across a dynamic Almeida-Thouless line in three dimensional Ising spin glass $Cu_{0.5}Co_{0.5}Cl_2$-$FeCl_3$ graphite bi-intercalation compound MASATSUGU SUZUKI, ITSUKO SUZUKI, SUNY-Binghamton — $Cu_{0.5}Co_{0.5}Cl_2$-$FeCl_3$ graphite intercalation compound is a three-dimensional short-range Ising spin glass with a spin freezing temparature T_g ($= 3.92 \pm 0.11$ K). The stability of the spin glass phase in the presence of a magnetic field H has been studied from the time dependence of zero-field cooled (ZFC) susceptibility χ_{ZFC} after a ZFC aging protocol with a waittime t_w ($= 1.0 \times 10^4$ and 3.0×10^4 sec). The relaxation rate $S(t)$ ($= \mathrm{d}\chi_{ZFC}/\mathrm{dln}\, t$) exhibits a local maximum at a characteristic time t_{cr}, The t dependence of χ_{ZFC} is well described by a stretched exponential relaxation ($\approx \exp[-(t/\tau)^{1-n}]$) in the vicinity of $\tau \approx t_w$, where $t \approx t_{cr}$. The H dependence of t_{cr} and τ is measured at the fixed temperature T ($2.9\ \mathrm{K} \leq T < T_g$): τ (t_{cr}) decreases with increasing H. Contour plots of H and T with constant τ form lines in the H-T plane, depending on the value of τ chosen. We find that the line with $\tau \approx 2.0 \times 10^3$ sec coincides with an Almeida-Thouless (AT) line where the irreversible effect of succeptibility appears. This result indicates that the spin glass phase is unstable in the presence of H. There is no AT line for short-range Ising spin glass.

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