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Anomalous field-sweep rate dependence of magnetization process of a spin-glass system $Fe_xMn_{1-x}TiO_3$. N. MIURA, H. ARUGA KATORI, A. ITO, RIKEN, M. SCHOENHART, R. GROESSINGER, Tech. Univ. Vienna, N. V. KOZLOVA, K. DOERR, IFW, Dresden, RIKEN TEAM, VIENNA TEAM, IFW TEAM — A mixed compound $Fe_{0.50}Mn_{0.50}TiO_3$ is a typical ising spin-glass. When a magnetic field is applied to the spin-glass state with a rather fast sweep rate $0.2 < dB/dt < 1$ T/s by a steady field magnet, the sample shows step-like jumps in the magnetization, whereas in a pulse magnet with an even faster sweep rate above 700 T/s, it shows a smooth metamagnetic transition. The field of the step-like jump is decreased as the sweep rate is increased, which is contrary to any relaxation phenomena with a slow response time. In the case of smooth metamagnetic transition at faster sweep rates, the transition field is increased as the sweep rate is increased. In this study, we investigated the magnetization process in the intermediate range of field sweep rate between 1.0 and 124 T/s using an ultra-long pulse magnet. It was found that as the sweep rate is increased, the jump behavior changes over to the metamagnetic behavior at around 2.5 T/s, where the transition field takes the minimum. The observed results are suggestive of some locally grown non-equilibrium spin alignment. The jump behavior is discussed in connection with similar phenomena in perovskite manganites.

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