

## Influence of pressure on magnetization and magnetostriction jumps in the manganite $(\text{Eu,Gd})_{0.58}\text{Sr}_{0.42}\text{MnO}_3$

T. Inomata<sup>a</sup>, M. Matsukawa<sup>a</sup>, Y. Nakanishi<sup>a</sup>, S. Kobayashi<sup>a</sup>, S. Nimori<sup>b</sup>, R. Suryanarayanan<sup>c</sup>, and N. Kobayashi<sup>d</sup>

<sup>a</sup>Department of Materials Science and Engineering, Iwate Univ. , Morioka 020-8551 , Japan

<sup>b</sup>National Institute for Materials Science, Tsukuba 305-0047 ,Japan

<sup>c</sup>Laboratoire de Physico-Chimie de L'Etat Solide,CNRS,UMR8648, Univ. Paris-Sud, 91405 Orsay,France

<sup>d</sup>Institute for Materials Research, Tohoku Univ., Sendai 980-8577, Japan

We have demonstrated the influence of external pressure on magnetization jump in Gd substituted  $\text{Eu}_{0.58}\text{Sr}_{0.42}\text{MnO}_3$ . The collapse of magnetization jump of the Eu based manganite caused by the applied pressure up to 1.2 GPa is explained by a suppression of the metastable blocked state, which is inherent to the phase separated manganite system exhibiting the magnetic avalanche. On the other hand, the magnetization jump of the Gd substituted sample is enhanced under the same pressure. To further examine the nature of the magnetization jump, the influence of pressure on the isothermal magnetostriction of the Gd substituted manganite is carried out. These findings indicate the crucial role on the abrupt transition played by the frozen phase separated phase.