 MLF Experimental Report	提出日 Date of Report
課題番号 Project No. 2013A0089 実験課題名 Title of experiment Low energy spin dynamics in d-electron heavy-fermion compound $\text{YMn}_2\text{Zn}_{20}$ probed by muon spin relaxation 実験責任者名 Name of principal investigator Ryosuke Kadono 所属 Affiliation IMSS, KEK	装置責任者 Name of responsible person Y. Miyake 装置名 Name of Instrument/(BL No.) D1 実施日 Date of Experiment May 20-22, 2013

試料、実験方法、利用の結果得られた主なデータ、考察、結論等を、記述して下さい。(適宜、図表添付のこと)
 Please report your samples, experimental method and results, discussion and conclusions. Please add figures and tables for better explanation.

1. 試料 Name of sample(s) and chemical formula, or compositions including physical form.
Mn pyrochlore, $\text{YMn}_2\text{Zn}_{1-x}\text{Al}_x$, $x=10.02$, solid pellet of polycrystals V perovskite, Sr_2VO_4 , solid pellet of polycrystals

2. 実験方法及び結果 (実験がうまくいかなかった場合、その理由を記述してください。) Experimental method and results. If you failed to conduct experiment as planned, please describe reasons.
<p>We measured zero and longitudinal-field muon spin relaxation (μSR) measurements to investigate the spin fluctuation in one of the above mentioned samples ($\text{YMn}_2\text{Zn}_{1-x}\text{Al}_x$, $x=10.02$) over a temperature range of 4.2–300 K. This time we were successful to observe μSR spectra from sample with good signal to noise ratio, and obtained data of depolarization rate vs temperature to clarify the temperature dependence of spin fluctuation rate.</p> <p>As shown in Fig.1, μSR spectrum under zero-field (ZF) exhibits exponential damping due to Mn moments, where the spectrum at 5 K shows that signal amplitude is nearly 80% of the total asymmetry. Although it is not clear in the present data, our previous μSR measurements with better time resolution indicates that the signal consists of two components with different depolarization rate, where one of them exhibits depolarization rate as large as a few MHz. In the present data, this component is observed as a reduction of initial asymmetry (see Fig.2). Application of moderate longitudinal field (=10 mT) induces incomplete suppression of depolarization probably for the component with smaller depolarization rate, indicating that the depolarization is due to dynamical fluctuation of Mn moments. Weaker depolarization at 300 K than that at 5 K shows that the</p>

2. 実験方法及び結果(つづき) Experimental method and results (continued)

fluctuation rate becomes slower at lower temperatures. Detailed analysis of these spectra are now in progress.

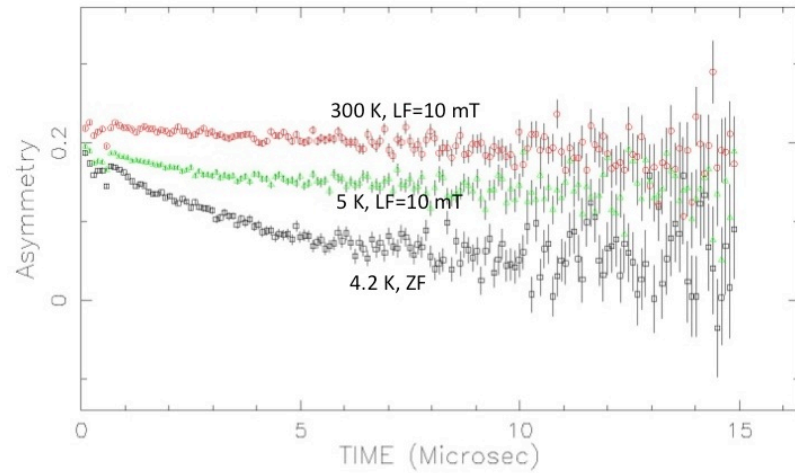


Fig.1: μ SR time spectra in $YMn_2Zn_{1-x}Al_x$ ($x=10.02$) at typical temperatures under zero or longitudinal fields.

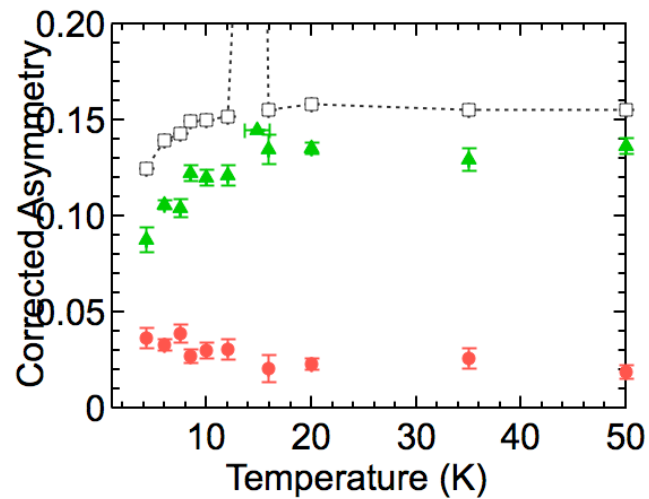


Fig.2: μ -e decay asymmetry vs temperature, where spectra are analyzed by curve fits assuming two components with different depolarization rate.