(※本報告書は英語で記述してください。ただし、産業利用課題として採択されている方は日本語で記述していただいても結構です。)

MLF Experimental Report	提出日 Date of Report
課題番号 Project No. 2012B0025 実験課題名 Title of experiment Measurement of the energy, multiplicity and angular correlation of gamma-rays from the thermal neutron capture reaction Gd-157 (n,gamma). 実験責任者名 Name of principal investigator Makoto Sakuda 所属 Affiliation Okayama University	装置責任者 Name of responsible person Hideo Harada (JAEA) 装置名 Name of Instrument/(BL No.) BL04 実施日 Date of Experiment March 15-17, 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.

1. Natural Gadolinium metal (foil, a thickness of 10 micro meters)
2. Natural Gadolinium metal (foil, a thickness of 20 micro meters)
3. Lead metal (208-Pb, foil, a thickness of 400 micro meters)

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.

We conducted an experiment to measure the gamma rays and their correlation from Gadolinium nuclei. The experiment was performed with ANNRI (Accurate Neutron-Nucleus Reaction Measurement Instrument) at BL04 beamline, between 15th March and 17th March 2013.
The targets were natural Gadolinium metal foils with a thickness of 10 micro meters and 20 micrometers. The data with lead and empty target were also taken to study the effects of neutron beam scattering, beam halo and effect of background off from beam pipe.

The schedule of the experiment is the following:
15th Mar. 2013, 10:00 - 14:00 : Natural Gadolinium (20 micro meters)
15th Mar. 2013, 14:00 - 17:00 : Blank (Empty target)
15th Mar. 2013, 17:00 - 10:00(16th) : Natural Gadolinium (10 micro meters)
16th Mar. 2013, 10:00 - 14:00 : Lead
16th Mar. 2013, 14:00 - 10:00(17th) : Natural Gadolinium (10 micro meters)
17th Mar. 2013, 10:00 - 09:00(18th) : Natural Gadolinium (20 micro meters)
After the experiment, we withdrew our samples from the beamline.

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

The datataking time and the amounts of data are the following:

Natural Gadolinium	(10 micro meters)	: total 36 hours,	2.0×10^{9} events
Natural Gadolinium	(20 micro meters)	: total 25 hours,	1.5×10^{9} events
Lead	(208-Pb, foil)	: total 4 hours,	1.5×10^{7} events
Empty	(target supporter	: total 3 hours,	1.4×10^{7} events

At the beginings and ends of the datataking, we checked the measured energy distribution and the time distribution of gamma rays. We checked that the gamma rays from Gadolinium and other targets were measured correctly for all the runs.

The data of our neutron beam experiment were taken back to Okayama University and converted to the ROOT format for the analysis, successfully. We plan to report on our experiment and the analysis at the forthcoming meetings and workshops.