 MLF Experimental Report	提出日 Date of Report 2016/8/31
課題番号 Project No. 2014A0079 実験課題名 Title of experiment Evaluation of newly developed fine imaging devices 実験責任者名 Name of principal investigator Takuro Sakai 所属 Affiliation JAEA	装置責任者 Name of responsible person Ken-ichi Oikawa 装置名 Name of Instrument/(BL No.) BL10 実施日 Date of Experiment 2014/5/19, 11/19

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. NRG spatial resolution indicator materials; Gd ₂ O ₃ on quartz plate Neutron collimators materials: Al ₂ O ₃ , SiO ₂ , H ₃ BO ₃

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. High spatial resolution type fluorescent plates and NRG spatial resolution indicator are tested. The fluorescent plates are consist of LiF and ZnS(Ag). The thickness of the effective layer is 30 μm. The indicator is laser-manufactured line and space patterns. The high-speed video camera is used as a detector. The schematic of the experimental apparatus is shown in Fig.1, and the obtained image is shown in Fig. 2. 100 μm-width line and space pattern is clearly seen. To improve the spatial resolution of neutron imaging technique, we have tested new neutron collimators. The collimators are manufactured by NGK INSULATORS, LTD., and consist of ceramic-based materials. The structure is fine grid and the pitch is less than 1 mm. The walls of the collimators are impregnated with boric acid. The photograph of the collimators is shown in Fig. 3. The schematic and photograph of experimental setup are shown in Fig. 4. It is expected that the parallelism of neutron beam (L/D) will be improved by the collimator, so that the resolution of neutron image will be enhanced. However, the expected result is not obtained. The reason might be the misalignment with neutron beam and the collimators. Because the parallelism of the collimators is so high, it is hard to align without adjustment instruments.

2. 実験

方法及び結果(つづき) Experimental method and results (continued)

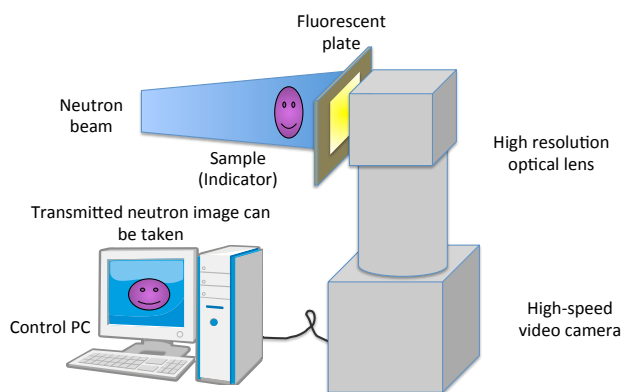


Fig. 1 Schematic of neutron imaging system

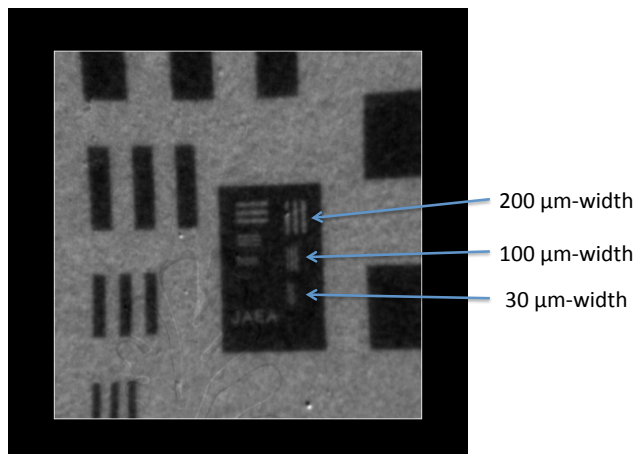


Fig. 2 Neutron radiograph of the spatial resolution indicator

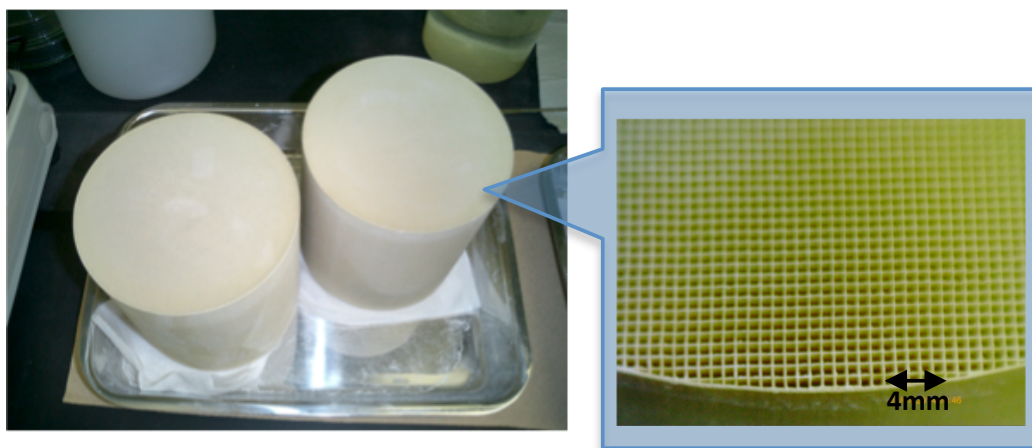


Fig. 3 The photograph of the collimators

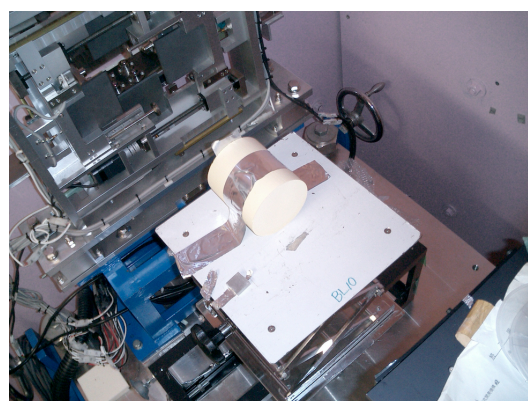
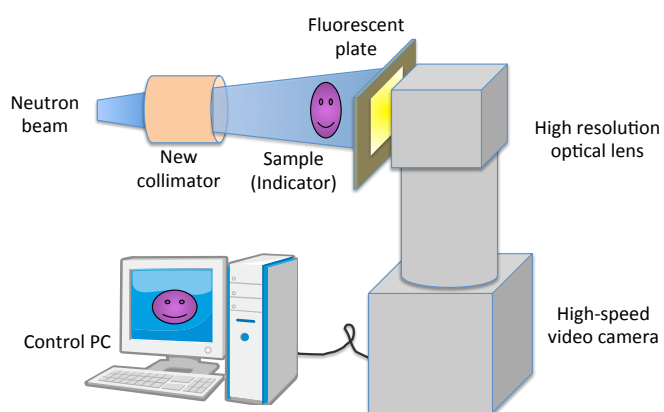


Fig. 4 The schematic (left) and photograph (right) of experimental setup