MLF Experimental Report	提出日 Date of Report
課題番号 Project No. 2012A0020 実験課題名 Title of experiment Studies of magnetostriction in the multiferroic spinel CdV_2O_4 実験責任者名 Name of principal investigator Brendan Kennedy 所属 Affiliation The University of Sydney	装置責任者 Name of responsible person Brendan Kennedy 装置名 Name of Instrument/（BL No.） BL-08 実施日 Date of Experiment

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.

Cadmium vanadium oxide $^{114}CdV_2O_4$ powder

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.

Powder neutron diffraction measurements were undertaken using the Super High Resolution Powder Diffractometer (SHRPD) at BL-08 of J-Parc. These required preparation of a sample enriched in ^{114}Cd. For these measurements the sample was housed in a thin-walled vanadium can and temperature control established using a CCR. After normalisation data were analysed using the GSAS.

A striking feature of the structural studies is that the structure is not tetragonal at 5K, but rather appears to be orthorhombic. The structure has been refined in space group *Fddd*. An example of the Rietveld refinement plot is shown in Figure 1. The presence of the orthorhombic distortion was established by examination of the region between d = 1.5 and 1.7 Å (Figure 2) where obvious problems with the tetragonal model were evident. Analysis of the data is on-going.

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

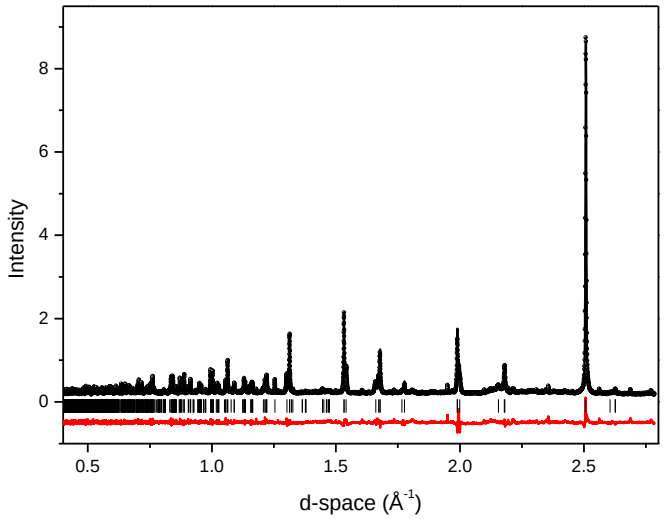

Figure 1. Observed calculated and difference profile for CdV_2O_4 at 5 K.

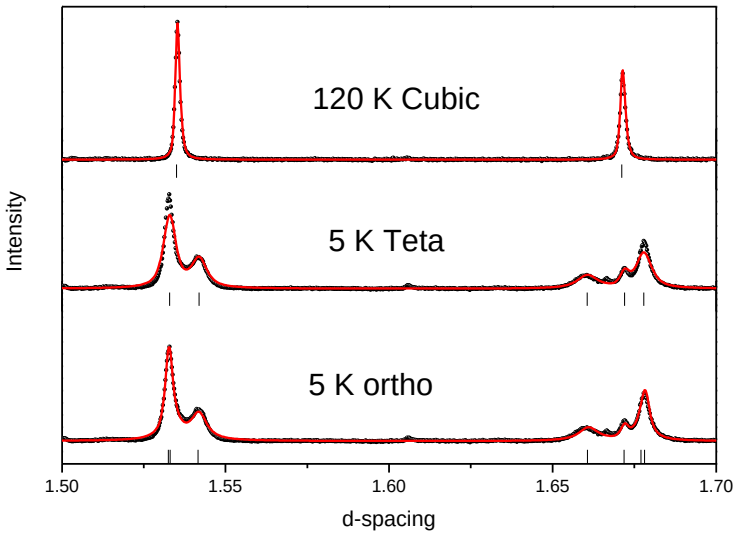

Figure 2. Portions of the observed calculated and difference profile for CdV_2O_4 at 120 and 5 K. The structure at 120 K is well fitted to a simple cubic model and illustrates the quality of the sample. The tetragonal model clearly fails to fit the pattern at 5K.