

國家同步輻射研究中心
National Synchrotron Radiation Research Center

出國報告書
Trip Report

出國人姓名(Name)： Shinichiro Yano

出國日期(Date of the trip)： Dec 13th to 19th 2016

目的地 (國家、城市) Destination (City, Country)：
Oak Ridge (USA)

參加會議名稱或考察、研究訓練地點 (Conference Name)：
Experiment at BASIS at the SNS

(請自下一頁開始撰寫) This is the cover page. Please write
the contents from the next page.

一、目的 (Purpose)

Shin-ichiro Yano and J S Gardner left the office in Sydney for two reasons. First to perform a high energy resolution experiment on gadolinium titanate. This experiment used BASIS at the Spallation Neutron Source (SNS) in Oak Ridge and is a follow-up to the failed experiment on SIKA. It required high energy resolution and low temperatures. While at the SNS we took advantage of the fact Matt Stone from SEQUOIA was in town and we learnt some tricks on how to analyse the data from that machine.

二、行程 (Itinerary/Schedule)

Depart work 11am December 13th (train to airport)

Sydney to Dallas (Plane) December 13th

Dallas to Knoxville December 13th arrive 9pm

Courtyard at the airport 13th to 16th

Dr Yano Arrived (similar route)

Courtyard in Knoxville 16th

Oak Ridge to Sydney December 17th-19th

Arrive home approx. noon (Train) December 19th

Dr Yano leaves Knoxville on the 19th, arrives Sydney on the 21st

三、內容摘要 (Summary) :

- 參加會議的項目或考察、研究訓練的主題 (The sessions you participate in the conference)

The experiment in Oak Ridge had issues. We had trouble cooling but at the second time of trying we got cold. We then discovered that the 5T magnet, in combination with a single crystal sample does not work well. The superconducting windings shielded the scattered neutrons from the detector. This meant we had to remove the cryomagnet and only use a cryostat. These lessons used up 3.5 days of our beam time. We learnt that this was only the 5th single crystal experiment on this beam line.

Dr Stone, ran a sample in November for us on his beam line Sequoia. This was successful but we wanted advice on how to handle the terabytes of data. We had very useful discussions with him.

- 與其他專家學者或人員的討論交流 (Discussion and interaction with other participants)

At experiment team at Oak Ridge consisted of:

Drs Georg Ehlers, John Ross Stewart, Nina Jalarvo, Sin-ichiro Yano and Paul McCarty.

Others that I saw include Mark Lumsden and Steve Nagler and Eugene Mamontov.

Trying to get the dilution refrigerator to cool took up most of our time in Oak Ridge, but once cold it worked really well. This was one of the first single crystal experiments on this machine, which rarely sees magnetic samples. This makes it ground breaking and of course produced some difficulties, but the team was able to overcome most of the problems. It looks as if we will never do a single crystal experiment on this machine, which is unfortunate, and may mean that experiment will cannot be performed with current instrumentation.

Due to time constraints, Shin and I shifted our participation in this experiment. I started it and he finished it. The experiment continued counting after I left, but all was working well and I think we will have some data to analyse but the signal was very weak.

四、心得概述與建議 (Reflection and Suggestion)

- 參加會議或考察設施、研究訓練的收獲 (What have you learned from the trip?)

The sample environment and instrument team at the SNS was very dedicated. They put in many hours to get this experiment working. The sample environment staff were in until 7pm some nights and back at 5am to help us set up and cold.

The instrument is performing well, but they should do more to cultivate a magnetism community. They typically work on liquid and polymer dynamics.

- 對中心的建議 (Your suggestions to NSRRC)

No suggestions