P01.08.65

Acta Cryst. (2008). A**64**, C191

Anniversary - 10 years of McStas for instrument design and science

Alain M Filhol[1], Peter Willendrup[2], Emmanuel Farhi[1], Erik Knudsen[2], Kim Lefmann[3]
[1]Institut Laue-Langevin, DS/CS, BP 156, 6 rue Jules Horowitz, Grenoble cedex 9, Is?re, 38042, France, [2]Risø DTU, Frederiksborgvej 399, POB 49, 4000 Roskilde, Denmark, [3]Niels Bohr Institute, University Copenhagen, Blegdamsvej, 172100 Copenhagen, Denmark, E-mail：filhol@ill.eu

Since 1998, the McStas neutron ray-tracing simulation package <http://www.mcstas.org/> has been hosted at RISØ in strong collaboration with the current leading european neutron facility at ILL, Grenoble. During its lifetime, McStas has evolved to become the world leading software in the area of neutron scattering simulations for instrument design, optimisation, virtual experiments and science. This poster presents a selection of the most important achievements during the last decade, with main focus on diffractometers and crystallography.

Keywords: neutrons, instrument design, virtual experiments

P01.10.66

Acta Cryst. (2008). A**64**, C191

Development of curved position-sensitive neutron detectors for FCD at HANARO

Myungkook Moon[1], Changhee Lee[1], Jongkyu Cheon[1], Shinae Kim[1], Yukio Noda[2]
[1]Korea Atomic Energy Research Institute, Neutron Physics, 150 Duckjin-dong, Yuseong, Daejeon, 305-353, Korea (S), [2]Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Japan, E-mail：moonmk@kaeri.re.kr

Four Circle Single Crystal Diffraction experiments need long scanning time for the single detector in scanning mode and it is always preferable to opt for single large area position sensitive detector covering the maximum angular scattering region and reduce the experimental duration and reactor beam utility time. In spite the fact that tube detector is accompanied with very compact and simple data acquisition setup, the experiment runs for the days and weeks at stretch. The 2-Dimensional Position-Sensitive Detector for FCD with effective window of 19x19 cm2 is initially developed and tested. The sensitive area coverage and parallax was improved by development of curved larger area 2-D PSD which covers 70 degree in horizontal direction and 45 degree in vertical one, respectively. Its preliminary result showed that the Curved structure worked as designed but the characteristic capacitance of the whole detector volume becomes larger than the designed value due to the cathodes' plane structure. Basic properties based on the plateau measurement and measuring capability from the short time diffraction measurements mentioned above on step scan and oscillation modes showed promising perspectives.

Keywords: position-sensitive detectors, neutron detectors, single-crystal diffraction

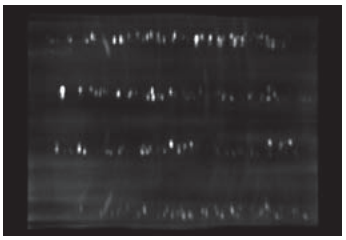
P01.10.67

Acta Cryst. (2008). A**64**, C191

Single crystal structure analysis by neutron 2D-PSD

Yoshihisa Ishikawa[1], Hiroyuki Kimura[1], Masashi Watanabe[1], Tadashi Yamazaki[1], Yukio Noda[1], ChangHee Lee[2], ShinAe Kim[2], MyungKook Moon[2]
[1]Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, 2-1-1 Katahira, Aoba-ku, Sendai, Miyagi, 980-8577, Japan, [2]Korea Atomic Energy Research Institute, 150 Deokjin-dong, Yuseong-gu, Daejeon 305-353, E-mail：y.ishi@mail.tagen.tohoku.ac.jp

In the field of X-ray single crystal structure analysis, the measurement by area detector such as Imaging Plate and CCD has already prevailed. On the other hand, there is rare case using area detector by neutron. Recently, 2 dimensional position sensitive detector (2D-PSD) with a high detection efficiency and spatial resolution has been developed by Korea Atomic Energy Research Institute group. In the case of materials which has low symmetry and large unit cell, it is expected that this area detector becomes much more powerful for structure analysis comparing with a conventional method by point detector. We thus tried crystal structure analysis of several interesting samples, NaCl, MnF_2, $DyMnO_3$, β'-ET_2ICl_2, and Lupene. The neutron diffraction experiment by 2D-PSD is performed at guide-hall T2-2 port of the JRR-3M reactor at Japan Atomic Energy Agency. Wavelength was set to 1.2451Å by Ge311. Figure 1 shows the oscillation image of β '-ET_2ICl_2. We developed the program for handling the data, such as ¨peak-search¨, ¨assignment of HKL indices¨, and ¨acquisition accurate intensity¨. Details of this program and the results of structure analyses will be introduced in the conference.



Keywords: area detector instrument, neutron diffraction techniques, neutron structure analysis

P01.10.68

Acta Cryst. (2008). A**64**, C191-192

Pixel array detectors for high count rate X-ray imaging

Mark W Tate[1], Marianne Hromalik[1], Lucas J Koerner[1], Hugh T Philipp[1], Daniel R Schuette[1], Sol M Gruner[1,2]
[1]Cornell University, Laboratory of Atomic and Solid State Physics, 194 Clark Hall, Ithaca, New York, 14853, USA, [2]Cornell University, Cornell High Energy Synchrotron Source, Ithaca, New York, 14853, USA, E-mail：mwt5@cornell.edu

In a pixel array detector, an efficient x-ray detection layer is coupled pixel-by-pixel to an underlying signal processing CMOS chip. By properly designing the in-pixel signal processing electronics within the CMOS chip, one can tailor the detector to a variety of x-ray imaging problems. The Cornell x-ray detector group has been developing a series of imaging devices which operate at high instantaneous count rates per pixel. Pixel architectures in the various generations of devices include multi-frame storage to record transient events on microsecond timescales, extended dynamic range imaging using combined digital and analog techniques, electronic shuttering for synchrotron bunch isolation, and high-speed, low-noise imaging from sub-picosecond x-ray pulses.

Keywords: X-ray detectors, detector development, time-