

S30-5 A new biological neutron diffractometer (iBIX) in J-PARC at the starting operation

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Ibaraki Prefectural Government has started to construct a TOF neutron diffractometer for biological macromolecules for industrial use (iBIX) at J-PARC, near JRR-3 in JAEA since 2004. From December in 2008, Ibaraki University will operate this machine and open beam time to users with a support of Ibaraki Prefecture. The diffractometer is designed to cover sample crystals which have their cell edges up to around 150 Å. It is expected to measure more than 100 samples per year if they have 2mm³ in crystal volume, and the efficiency will be more than 100 times larger than the present high performance diffractometers, BIX-4 in JRR-3 reactor in JAEA after full power operation of J-PARC in a few years. To realize this performance, a coupled moderator (intense neutrons, but broad pulse in time resolution) was selected. In addition, two important and key items should be developed; a new detector with high spatial resolution (less than 1mm) and a special software to de-convolute overlapped Bragg reflections in data reduction. The detector uses ZnS scintillator with converters of ¹⁰B₂O₃, equipped with wavelength-shift-fiber (WLSF) system. The software has been designed using a complicated kind of profile-fitting method. Recent experimental results showed the detector operated so well and pulsed neutron flux at the sample was strong for the beam power. The final commissioning status and examples measured by iBIX will be reported.