

## Development of neutron spin echo spectrometers at C2 cold neutron guide of JRR-3M

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We constructed and improved a neutron spin echo spectrometer (ISSP-NSE) which was installed at C2-2 cold guide port of JRR-3M, JAEA by Institute for Solid State Physics (ISSP), University of Tokyo[1-4]. The NSE spectrometer is equipped with two optimal field shape (OFS) coils for precession with the maximum field integral  $D_{\max} = 0.22$  Tm. It was designed in order to study the dynamical behavior of large assemblies made of medium-sized or large molecules and also to the dynamical critical behavior of condensed matters.

Since the space for a spectrometer at C3-1 port of JRR-3M was too small to study dynamics of a mesoscopic structure using small angle scattering, we renounced the original plan that the NSE spectrometer of ISSP was to be installed at C3-1 port and made ISSP-NSE share the C2-2 port with the neutron spectral modulation spectrometer (NSM) which had been constructed at C2-2 port. The space for ISSP-NSE at C2-2 port was still narrow, which restricted the maximum scattering angle by  $15^\circ$ . The positions of the precession coil are close to the radiation protection covers of the neutron guide for C2-3 port made of iron. The magnetized iron disturbs the magnetic field for the precession and causes the field-integral inhomogeneity. Since the spectrometer is not located at the neutron guide end, the incident neutrons were deflected by a double-reflection monochromater at the C2-2 port. The double reflection at the monochromater decreased the neutron flux and made it difficult to change the neutron wavelength.

Recently, ISSP-NSE was relocated to the C2-3-1 port (guide end) of JRR-3M, graded up and renamed iNSE[5,6]. This relocation project is expected to resolve the above problems. I report on developments of parts of NSE spectrometers such as wide cross section spiral correction coils. I also present developments of new-type  $\pi$  and  $\pi/2$  flippers, which operate with steady current independently of the neutron wavelength, for a time-of-flight neutron spin echo spectrometer at a pulsed spallation neutron source[7-9].

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