

PELICAN –a Time of Flight Cold Neutron Spectrometer – New Capabilities

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The time-of-flight direct-geometry neutron spectrometer, Pelican, has been in user programme since 2014 at the OPAL research reactor, at the Australian Nuclear Science and Technology Organisation (ANSTO). The Pelican instrument was designed to meet the diverse requirements of the Australian scientific community from physics, chemistry, material science, to biology. A wide range of research fields is covered. These include crystal-field excitations, phonon densities of states, magnetic excitations for various multifunctional materials including high Tc superconductors, novel magnetic, thermoelectric, ferroelectric and piezoelectric materials; molecular dynamics in hydrogen-bonded and storage materials, catalytic materials, cements, soils and rocks; and water dynamics in proteins and ion diffusion in membranes. Polarized neutrons and polarisation analysis option makes the full use of the neutron spin to study magnetism and to separate the coherent and incoherent scatterings.

To cover the broad range of scientific fields, a series of sample environment equipment has been developed. These include a standard cryofurnace capable of providing sample temperature from 1.5 K to 800 K, and special sample environments such as gas sorption, light irradiation, electric fields and dilution temperatures at 50 mK. Recently, we have further extended the instrument capabilities to high magnetic fields up to 7 T, a fast dilution system reaching 10 mK, and a high pressure cell suitable for pressures up to 2 GPa. These new sample environment capabilities have opened up new scientific opportunities on the instrument. In this presentation, we shall describe the performance of the new equipment and the potential new science associated with them.

Level of Expertise

Expert

Speakers Gender

Male

Do you wish to take part in the poster slam

No

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