

The Thermal Triple-Axis and Filter Spectrometers on TAIPAN

Tuesday, 3 December 2019 11:00 (15 minutes)

The thermal triple-axis spectrometer on TAIPAN has been running for over ten years and together with the filter spectrometer which has been running for three and half years have contributed to a variety of studies in solid-state physics and chemistry, materials science and engineering, geosciences, energy science, and the biosciences. In particular a strong focus has been elucidating the magnetism in highly ordered thin film multilayers, heterostructures, and superlattices, as well as studying low lying excitations such as in high T_c superconductor materials. The so-called Beryllium filter spectrometer, on the other hand, has been to date used predominately on powdered hydrogenous material. Hydrogen has a large isotropic incoherent scattering cross-section which allows for local molecular vibrations and structure to be directly probed. The mechanics of interaction between molecular units is studied through the analysis of the vibrational spectra which is achieved through a knowledge of the structure of each material, symmetry arguments that may be obtained via group theoretical analysis, and of course through calculation, such as force field arguments and calculations, and ab-initio approaches. Here the two spectrometers are briefly described giving an overview of their capabilities. Five pieces of current scientific work are also given as good examples showing the capability and type of work done on TAIPAN. These are magnetism in strained magnetic thin films, low energy excitations in strongly correlated materials, lanthanide zirconates as model nuclear containment materials, hydrogen in steels, and aminoboranes.

Level of Expertise

Expert

Do you wish to take part in the poster slam

No

Travel Funding

No

Speakers Gender

Male

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