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NEWSLETTER

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tascc

News about Chalk River's Tandem Accelerator Superconducting Cyclotron facility for users and potential users

National workshop explores use of TASCC for materials science studies

Twenty-two people, including nine from CRL, attended a 2-1/2 day workshop held May 6-8 at the Chalk River Laboratories.

Four invited speakers reviewed heavy-ion damage effects in different materials. M. Toulemonde (GANIL) reviewed insulators; Y.Quére (Ecole Polytechnique, Paris) reviewed metals; A. Campbell (Naval Research Labs, Washington) reviewed microcircuits, and R. Spohr (GSI) reviewed polymers.

As a result of the workshop three requests have already been received to perform materials science experiments with TASCC beams.

The proposals involve participation of scientists from the Defence Research Establishment in Ottawa, McMaster University, Naval Research Labs, Washington and the University of Toronto.

"A lifetime in physics"

A symposium with this title was held May 31 to honour T.K. (Tom) Alexander on the occasion of his 60th birthday and retirement from TASCC.

To indicate the extremely broad range of Tom's involvement in physics,the symposium featured eight invited talks covering:accelerator mass spectrometry; optically pumped polarized ^{3}He targets; first forbidden β-decay near Pb; positrons from heavy-ion collisions;

Participants gathered at Chalk River to attend the physics symposium held May 31 to honour Tom Alexander.

Facility report

Two experiments were performed by the 8π-spectrometer collaborators, one using a newly-developed 4.45 MeV/u germanium-76 beam from the cyclotron. As well, another new cyclotron beam, 5.5 MeV chlorine-37, was developed by TASCC Supervisors and Operators (unaided by cyclotron specialists) for the first time.

The Tandem accelerator was shut down for five days of scheduled maintenance, which included routine column servicing, upgrades to improve high-voltage performance and general cleaning.

Two cyclotron runs were postponed following failure of helium compressors in the cryogenic system. (See details below.) The alloted time periods were instead rescheduled with experiments requiring Tandem-only beams.

Beams produced by the Tandem included: 17 MeV protons; 25 MeV deuterons; 19.7 MeV lithium-7; 155 MeV sulphur-32; 16.1 and 195 MeV chlorine-37, and 319 MeV germanium-76.

29-01

inner-shell excitation in heavy-ion channeling; the $^{12}C(\alpha,\gamma)^{16}O$ cross-section at low energy, and renormalization of operators in the nuclear medium.

Speakers and chairmen included Ken Allen, Jim Geiger, Ted Litherland, Otto Häusser, Walter Davies, Ernie Warburton, Ian Towner, Hay-Boon Mak, Russell Betts, John Kuehner, Jim Forster and Gordon Ball. Over 40 colleagues attended the one-day program.

The physics program was followed in the evening by a retirement dinner attended by over 100 well-wishers. It featured a concert by a piano quintet of friends, which played works by Schubert and Schumann.

Screw compressors ruin two cyclotron runs

Failure of both helium screw compressors on the holiday weekend this month caused a complete shutdown of the cryogenic system and an emptying of the cyclotron magnet cryostat just prior to a scheduled production run.

The operating screw compressor burst a high-pressure gas/oil line, resulting in pure helium gas escaping from our large storage tanks and air being admitted. A second screw compressor was started to circulate the now-impure helium through cleanup filters, but this unit had developed an unsuspected water leak in its oil cooler. Additional contamination of the system with water and oil resulted.

When regeneration of the liquefier's charcoal filters proved unsuccessful, the machine was opened to replace both contaminated filters. Various liquid-helium transfer lines were also warmed to remove frozen contaminants.

A total of 22 days, which extended into June, were necessary to restore the system to normal operating conditions and refill the magnet cryostat. Liquid helium was purchased commercially during the cleanup to keep the superconducting magnet coils from warming excessively.

Two cyclotron runs were postponed during the repair, cleanup and subsequent cooldown of the system.

May Experiments

Experiment	: Development of 4.45 MeV per nucleon ^{76}Ge for the first time from the superconducting cyclotron
Researchers	: TASCC Beam Commissioning Team
Beam	: 319 MeV $^{76}Ge^{+12}$
Duration	: 4 days

Experiment	: Search for enhancement of superdeformation population in lead isotopes
Researchers	: G. Zwartz, M. Cromaz and T.E. Drake *(U of Toronto)*, V.P Janzen *(TASCC/ McMaster U)*; D.Ward, H.R. Andrews, A. Galindo-Uribarri *(TASCC)*; D. Prevost, J. Rodriguez, A. Omar and L. Persson (*McMaster U*) and J.F. Sharpey-Schafer (*U of Liverpool*)
Beam	: 319 MeV $^{76}Ge^{+12}$
Duration	: 4 days

Experiment	: Development of 5.5 MeV per nucleon ^{37}Cl for the first time from the superconducting cyclotron
Researchers	: TASCC Supervisors and Operators
Beam	: 204 MeV $^{37}Cl^{+8}$; not extracted
Duration	: 3 days

Experiment	: Tests and commissioning of new ALF (Array for Light Fragments) miniball charged-particle detector system
Researchers	: A. Galindo-Uribarri, D. Ward, G.C. Ball, H.R. Andrews, D.C. Radford (*TASCC*); V.P. Janzen (*TASCC/McMaster U*); J. Rodriguez, J.C. Waddington and S. Mullins (*McMaster U.*); T.E. Drake, G. Zwartz and M. Cromaz (*U of Toronto*)
Beams	: 155 MeV $^{32}S^{+11}$; 195 MeV $^{37}Cl^{+14}$
Duration	: 6 days

Next month.....

- RTE for chlorine in silicon crystals
- Measurement of weak decay mode of Mn-50 with ISOL
- AMS development with Cl-36
- Search for hyperdeformation in Cr-48 with miniball and 8π spectrometer
- Develop N-14 at 40 MeV per nucleon with the cyclotron
- Tests of detectors for reaction studies with high-energy chlorine beam

Facility operating record

Elapsed Time (Year-to-date) 3671 h

	Tandem	Cyclotron
Beam Available	2413.3	392.1
Beam Development	558.3	671.1
Scheduled Shutdown	623.0	2449.6
Unscheduled Shutdown	76.4	158.2

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