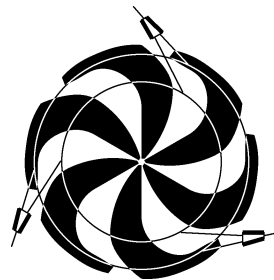


TRIUMF



ANNUAL REPORT SCIENTIFIC ACTIVITIES 2004

ISSN 1492-417X

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UNDER A CONTRIBUTION FROM THE
NATIONAL RESEARCH COUNCIL OF CANADA

OCTOBER 2005

The contributions on individual experiments in this report are outlines intended to demonstrate the extent of scientific activity at TRIUMF during the past year. The outlines are not publications and often contain preliminary results not intended, or not yet ready, for publication. Material from these reports should not be reproduced or quoted without permission from the authors.

PUBLICATIONS

This appendix lists publications describing work performed at TRIUMF and also work conducted elsewhere by TRIUMF personnel and TRIUMF users.

Journal Publications

Particle, Nuclear and Atomic Physics

P. Dubé and M. Trinczek, *Hyperfine structure splittings and absorption strengths of molecular iodine transitions near the trapping frequencies of francium*, J. Optical Society of America **B21**, 1113 (2004).

Z. Salman, E.P. Reynard, R.F. Kiefl, W.A. MacFarlane, J. Chakhalian, K.H. Chow, S. Daviel, S. Kreitzman, C.D.P. Levy and R. Poutissou, *Beta-detected nuclear quadrupole resonance with a low energy beam of $^8\text{Li}^+$* , Phys. Rev. **B70**, 104404 (2004).

U. Greife, S. Bishop, L. Buchmann, M.L. Chatterjee, A.A. Chen, J.M. D'Auria, S. Engel, D. Gigliotti, D. Hunter, D.A. Hutcheon, A. Hussein, C.C. Jewett, A.M. Laird, M. Lamey, W. Liu, A. Olin, D. Ottewell, J. Rogers and C. Wrede, *Energy loss around the stopping power maximum of Ne, Mg and Na ions in hydrogen gas*, Nucl. Instrum. Methods **B217**, 1 (2004).

M. Hunyadi, C. Bäumer, A.M. van den Berg, N. Blasi, M. Csatlós, L. Csige, B. Davids, U. Garg, J. Gulyás, M.N. Harakeh, M. de Huu, B.C. Junk, A. Krasznahorkay, S. Rakers, D. Sohler and H.J. Wörtche, *Particle decay of the isoscalar giant dipole resonance in ^{208}Pb* , Nucl. Phys. **A731**, 49 (2004).

J. Guillot, D. Beaumel, A.M. van den Berg, S. Brandenburg, B. Davids, F. Fortier, M. Fujiwara, S. Galés, M.N. Harakeh, M. Hunyadi, M. de Huu and H.J. Wörtche, *Investigation of IVGRs via the $^{58}\text{Ni}(t, ^3\text{He})^{58}\text{Co}$ reaction*, Nucl. Phys. **A731**, 106 (2004).

E.W. Grewe, C. Bäumer, A.M. van den Berg, N. Blasi, B. Davids, D. De Frenne, D. Frekers, P. Haefner, M.N. Harakeh, M. Huynyadi, E. Jacobs, B. Junk, A. Korff, A. Negret, P. von Neumann-Cosel, L. Popescu, S. Rakers and H.J. Wörtche, *Gamow-Teller transitions to ^{32}P studied through the $^{32}\text{S}(d, ^2\text{He})$ reaction at $E_d = 170$ MeV*, Phys. Rev. **C69**, 064325 (2004).

S. Rakers, C. Bäumer, A.M. van den Berg, B. Davids, D. Frekers, D. De Frenne, Y. Fujita, E.-W. Grewe, P. Haefner, M.N. Harakeh, M. Hunyadi, E. Jacobs, H. Johansson, B.C. Junk, A. Korff, A. Negret, L. Popescu, H. Simon and H.J. Wörtche, *Nuclear matrix elements for the ^{48}Ca two-neutrino double- β decay from high-resolution charge-exchange reactions*, Phys. Rev. **C70**, 054302 (2004).

A. Korff, P. Haefner, C. Bäumer, A.M. van den Berg, N. Blasi, B. Davids, D. De Frenne, R. de Leo, D. Frekers, E.-W. Grewe, M.N. Harakeh, F. Hofmann, M. Hun-

yadi, E. Jacobs, B.C. Junk, A. Negret, P. von Neumann-Cosel, L. Popescu, S. Rakers, A. Richter and H.J. Wörtche, *Deuteron elastic and inelastic scattering at intermediate energies from nuclei in the mass range $6 \leq A \leq 116$* , Phys. Rev. **C70**, 067601 (2004).

G.S. Mitchell, C.S. Blessinger, J.D. Bowman, T.E. Chupp, K.P. Coulter, M. Gericke, G.L. Jones, M.B. Leuschner, H. Nann, S.A. Page, S.I. Penttila, T.B. Smith, W.M. Snow and W.S. Wilburn, *A measurement of parity-violating gamma-ray asymmetries in polarized cold neutron capture on ^{35}Cl , ^{113}Cd , and ^{139}La* , Nucl. Instrum. Methods **A521**, 468 (2004) [nucl-ex/0401009].

A. Bacchetta, U. D'Alesio, M. Diehl and C.A. Miller, *Single-spin asymmetries: the Trento conventions*, Phys. Rev. **D70**, 117504 (2004) [DESY-04-193, hep-ph/0410050].

F. Sarazin, J.S. Al-Khalili, G.C. Ball, G. Hackman, P.M. Walker, R.A.E. Austin, B. Eshpeter, P. Finlay, P.E. Garrett, G.F. Grinyer, K.A. Koopmans, W.D. Kulp, J.R. Leslie, D. Melconian, C.J. Osborne, M.A. Schumaker, H.C. Scraggs, J. Schwarzenberg, M.B. Smith, C.E. Svensson, J.C. Waddington and J.L. Wood, *Halo neutrons and the β decay of ^{11}Li* , Phys. Rev. **C70**, 031302 (2004) [TRI-PP-04-13].

S. Shimizu, K. Horie, M. Aliev, Y. Asano, T. Baker, P. Depommier, M. Hasinoff, Y. Igarashi, J. Imazato, A.P. Ivashkin, M.M. Khabibullin, A.N. Khotjantsev, Y.G. Kudenko, A. Levchenko, G.Y. Lim, J.A. Macdonald, O.V. Mineev, C. Rangacharyulu and S. Sawada, *Measurement of $K^+ \rightarrow \pi^0 \pi^0 e^+ \nu$ (K_{e4}^{00}) decay using stopped positive kaons*, Phys. Rev. **D70**, 037101 (2004) [hep-ex/0408098].

J.T.M. Goon, D.J. Hartley, L.L. Riedinger, M.P. Carpenter, F.G. Kondev, R.V.F. Janssens, K.H. Abu Saleem, I. Ahmad, H. Amro, J.A. Cizewski, C.N. Davids, M. Danchev, T.L. Khoo, A. Heinz, T. Lauritsen, W.C. Ma, G.L. Poli, J. Ressler, W. Reviol, D. Seweryniak, M.B. Smith, I. Wiedenhöver and J.-Y. Zhang, *Shape coexistence and band crossings in ^{174}Pt* , Phys. Rev. **C70**, 014309 (2004).

J.M. D'Auria, R.E. Azuma, S. Bishop, L. Buchmann, M.L. Chatterjee, A.A. Chen, S. Engel, D. Gigliotti, U. Greife, D. Hunter, A. Hussein, D. Hutcheon, C.C. Jewett, J. José, J.D. King, A.M. Laird, M. Lamey, R. Lewis, W. Liu, A. Olin, D. Ottewell, P. Parker, J. Rogers, C. Ruiz, M. Trinczek and C. Wrede, *The $^{21}\text{Na}(p, \gamma)^{22}\text{Mg}$ reaction from $E_{c.m.} = 200$ to 1103 keV in novae and x-ray bursts*, Phys. Rev. **C69**, 065803 (2004).

R.J. Peterson, C.E. Allgower, V. Bekrenev, W.J. Briscoe, J.R. Comfort, K. Craig, D. Grosnick, D. Isenhower, N.

- Knecht, D. Koetke, A.A. Kulbardiš, G. Lolos, V. Lopatin, D.M. Manley, R. Manweiler, A. Marušić, S. McDonald, B.M.K. Nefkens, J. Olmsted, Z. Papandreou, D.C. Peaslee, N. Phaisangittiskaul, J. Price, D.E. Prull, A.F. Ramirez, M. Sadler, A. Shafi, H. Spinka, T.D.S. Stanislaus, A. Starostin, H.M. Staudenmaier, I. Strakovsky and I. Supek, *y scaling in quasifree pion-single-charge exchange*, Phys. Rev. **C69**, 064612 (2004).
- E. Friedman, M. Bauer, J. Breitschopf, H. Clement, H. Denz, E. Doroshkevich, A. Erhardt, G.J. Hofman, R. Meier, G.J. Wagner and G. Yaari, *The in-medium isovector πN amplitude from low energy pion scattering*, Phys. Rev. Lett. **93**, 122302 (2004) [nucl-ex/0404031].
- P.A. Zolnierczuk, D.S. Armstrong, E. Christy, J.H.D. Clark, T.P. Goringe, M.D. Hasinoff, M.A. Kovash, S. Tripathi and D.H. Wright, *Search for exotic baryons in double radiative capture on pionic hydrogen*, Phys. Lett. **B597**, 131 (2004) [nucl-ex/0403046].
- C.D. O'Leary, R. Wadsworth, P. Fallon, C.E. Svensson, K. Ragnarsson, D.E. Appelbe, R.A.E. Austin, G.C. Ball, J.A. Cameron, M.P. Carpenter, R.M. Clark, M. Cromaz, M.A. Deleplanque, R.M. Diamond, D.F. Hodgson, R.V.F. Janssens, D.G. Jenkins, N.S. Kelsall, G.J. Lane, C.J. Lister, A.O. Macchiavelli, D. Saranites, F.S. Stephens, D. Seweryniak, K. Vetter, J.C. Waddington and D. Ward, *High spin study of rotational structures in ^{72}Br* , Phys. Rev. **C69**, 034316 (2004).
- N.S. Kelsall, C.E. Svensson, S.M. Fisher, D.E. Appelbe, R.A.E. Austin, D.P. Balamuth, G.C. Ball, J.A. Cameron, M.P. Carpenter, R.M. Clark, M. Cromaz, M.A. Deleplanque, R.M. Diamond, P. Fallon, D.F. Hodgson, R.V.F. Janssens, D.G. Jenkins, G.J. Lane, C.J. Lister, A.O. Macchiavelli, C.D. O'Leary, D.G. Saranites, F.S. Stephens, D.C. Schmidt, D. Seweryniak, K. Vetter, J.C. Waddington, R. Wadsworth, D. Ward, A.N. Wilson, A.V. Afanasjev, S. Frauendorf and I. Ragnarsson, *High spin structure of N - Z nuclei around the $A=72$ region*, Eur. Phys. J. **A20**, 131 (2004).
- R. Meier, M. Cröni, R. Bilger, B. van den Brandt, J. Breitschopf, H. Clement, J.R. Comfort, H. Denz, A. Erhardt, K. Föhl, E. Friedman, J. Gräter, P. Hautle, G.J. Hofman, J.A. Konter, S. Mango, J. Pätzold, M.M. Pavan, G.J. Wagner, G. von Wrochem, *Low energy analyzing powers in pion-proton elastic scattering*, Phys. Lett. **B588**, 155 (2004) [nucl-ex/0402018].
- G.D. Morris, W.A. MacFarlane, K.H. Chow, Z. Salman, D.J. Arseneau, S. Daviel, A. Hatakeyama, S.R. Kreitzman, C.D.P. Levy, R. Poutissou, R.H. Heffner, J.E. Elenewski, L.H. Greene and R.F. Kiefl, *β -detected NMR of ^8Li implanted in a thin silver film*, Phys. Rev. Lett. **93**, 157601 (2004).
- P. Camerini, E. Fragiaco, N. Grion, S. Piano, R. Rui, J. Clark, L. Felawka, E.F. Gibson, G. Hofman, E.L. Mathie, R. Meier, G. Moloney, D. Ottewell, K. Raywood, M.E. Sevior, G.R. Smith and R. Tacik, *General properties of the pion production reaction in nuclear matter*, Nucl. Phys. **A735**, 89 (2004) [nucl-ex/0401018].
- P.-N. Seo, J.D. Bowman, M. Gericke, J. Long, G.S. Mitchell, S.I. Penttila and W.S. Wilburn, *A measurement of the Flight Path 12 cold moderator brightness at LAN-SCE*, Nucl. Instrum. Methods **A517**, 285 (2004).
- S. Adler *et al.* (BNL E787 collaboration), *Further search for the decay $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ in the momentum region $P < 195 \text{ MeV}/c$* , Phys. Rev. **D70**, 037102 (2004) [BNL-72163-2004-JA, hep-ex/0403034].
- V.V. Anisimovsky *et al.* (BNL E949 collaboration), *Improved measurement of the $K^+ \rightarrow \nu \bar{\nu}$ branching ratio*, Phys. Rev. Lett. **93**, 031801 (2004) [TRI-PP-04-07, BNL-72164-2004-JA, KEK-PREPRINT-2004-2, FERMILAB-PUB-04-173-E, hep-ex/0403036].
- K.A. Aniol *et al.* (HAPPEX collaboration), *Parity violating electroweak asymmetry in polarized $\bar{e}p$ scattering*, Phys. Rev. **C69**, 065501 (2004) [JLAB-PHY-04-4, nucl-ex/0402004].
- A. Airapetian *et al.* (HERMES collaboration), *Flavor decomposition of the sea quark helicity distributions in the nucleon from semi-inclusive deep-inelastic scattering*, Phys. Rev. Lett. **92**, 012005 (2004) [DESY-03-067, hep-ex/0307064].
- A. Airapetian *et al.* (HERMES collaboration), *Nuclear polarization of molecular hydrogen recombined on a non-metallic surface*, Eur. Phys. J. **D29**, 21 (2004) [DESY-03-168, physics/0408138].
- A. Airapetian *et al.* (HERMES collaboration), *Evidence for a narrow $|S| = 1$ baryon state at a mass of 1528 MeV in quasi-real photoproduction*, Phys. Lett. **B585**, 213 (2004) [DESY-03-213, HERMES-DC-56, hep-ex/0312044].
- A. Airapetian *et al.* (HERMES collaboration), *Hard exclusive electroproduction of $\pi^+ \pi^-$ pairs*, Phys. Lett. **B599**, 212 (2004) [DESY-04-097, hep-ex/0406052].
- M. Abe *et al.* (KEK-E246 collaboration), *A new limit of T -violating transverse muon polarization in the $K^+ \rightarrow \pi^0 \mu^+ \nu$ decay*, Phys. Rev. Lett. **93**, 131601 (2004) [hep-ex/0408042].
- G. Abbiendi *et al.* (OPAL collaboration), *Tests of models of color reconnection and a search for glueballs using gluon jets with a rapidity gap*, Eur. Phys. J. **C35**, 293 (2004) [CERN-EP-2003-031, hep-ex/0306021].
- G. Abbiendi *et al.* (OPAL collaboration), *Search for R -parity violating decays of scalar fermions at LEP*, Eur. Phys. J. **C33**, 149 (2004) [CERN-EP-2003-036, hep-ex/0310054].
- G. Abbiendi *et al.* (OPAL collaboration), *Search for anomalous production of dilepton events with missing transverse momentum in $e^+ e^-$ collisions at $\sqrt{s} = 183\text{--}209 \text{ GeV}$* , Eur. Phys. J. **C32**, 453 (2004) [CERN-EP-2003-040, hep-ex/0309014].

- G. Abbiendi *et al.* (OPAL collaboration), *Measurement of charged current triple gauge boson couplings using W pairs at LEP*, Eur. Phys. J. **C33**, 463 (2004) [CERN-EP-2003-042, hep-ex/0308067].
- G. Abbiendi *et al.* (OPAL collaboration), *A study of $W^+W^-\gamma$ events at LEP*, Phys. Lett. **B580**, 17 (2004) [CERN-EP-2003-043, hep-ex/0309013].
- G. Abbiendi *et al.* (OPAL collaboration), *A study of charm production in beauty decays with the OPAL detector at LEP*, Eur. Phys. J. **C35**, 149 (2004) [CERN-EP-2003-050, hep-ex/0308050].
- G. Abbiendi *et al.* (OPAL collaboration), *Tests of the standard model and constraints on new physics from measurements of fermion pair production at 189–209 GeV at LEP*, Eur. Phys. J. **C33**, 173 (2004) [CERN-EP-2003-053, hep-ex/0309053].
- G. Abbiendi *et al.* (OPAL collaboration), *Experimental studies of unbiased gluon jets from e^+e^- annihilations using the jet boost algorithm*, Phys. Rev. **C69**, 032002 (2004) [CERN-EP-2003-067, hep-ex/0310048].
- G. Abbiendi *et al.* (OPAL collaboration), *Flavor independent search for Higgs bosons decaying into hadronic final states in e^+e^- collisions at LEP*, Phys. Lett. **B597**, 11 (2004) [CERN-EP-2003-081, hep-ex/0312042].
- G. Abbiendi *et al.* (OPAL collaboration), *Measurement of the partial widths of the Z into up and down type quarks*, Phys. Lett. **B586**, 167 (2004) [CERN-EP-2003-082, hep-ex/0312043].
- G. Abbiendi *et al.* (OPAL collaboration), *W boson polarization at LEP2*, Phys. Lett. **B585**, 223 (2004) [CERN-EP-2003-088, hep-ex/0312047].
- G. Abbiendi *et al.* (OPAL collaboration), *Search for chargino and neutralino production at $\sqrt{1/2} = 192\text{--}209$ GeV at LEP*, Eur. Phys. J. **C35**, 1 (2004) [CERN-EP-2003-090, hep-ex/0401026].
- G. Abbiendi *et al.* (OPAL collaboration), *Constraints on anomalous quartic gauge boson couplings from $\nu\bar{\nu}\gamma\gamma$ and $q\bar{q}\gamma\gamma$ events at LEP2*, Phys. Rev. **D70**, 032005 (2004) [CERN-PH-EP-2004-003, hep-ex/0402021].
- G. Abbiendi *et al.* (OPAL collaboration), *Study of Bose-Einstein correlations in $e^+e^- \rightarrow W^+W^-$ events at LEP*, Eur. Phys. J. **C36**, 297 (2004) [CERN-PH-EP-2004-008, hep-ex/0403055].
- G. Abbiendi *et al.* (OPAL collaboration), *Measurement of the strange spectral function in hadronic τ decays*, Eur. Phys. J. **C35**, 437 (2004) [CERN-PH-EP-2004-010, hep-ex/0406007].
- G. Abbiendi *et al.* (OPAL collaboration), *Scaling violations of quark and gluon jet fragmentation functions in e^+e^- annihilations at $\sqrt{s} = 91.2$ GeV and 183–209 GeV*, Eur. Phys. J. **C37**, 25 (2004) [CERN-PH-EP-2004-011, hep-ex/0404026].
- G. Abbiendi *et al.* (OPAL collaboration), *Search for neutral Higgs boson in CP-conserving and CP-violating MSSM scenarios*, Eur. Phys. J. **C37**, 49 (2004) [CERN-PH-EP-2004-020, hep-ex/0406057].
- G. Abbiendi *et al.* (OPAL collaboration), *Determination of the LEP beam energy using radiative fermion-pair events*, Phys. Lett. **B604**, 31 (2004) [CERN-PH-EP-2004-042, hep-ex/0408130].
- B. Aharmim *et al.* (SNO collaboration), *Electron antineutrino search at the Sudbury Neutrino Observatory*, Phys. Rev. **D70**, 093014 (2004) [hep-ex/0407029].
- S.N. Ahmed *et al.* (SNO collaboration), *Measurement of the total active 8B solar neutrino flux at the Sudbury Neutrino Observatory with enhanced neutral current sensitivity*, Phys. Rev. Lett. **92**, 181301 (2004) [nucl-ex/0309004].
- S.N. Ahmed *et al.* (SNO collaboration), *Constraints on nucleon decay via ‘invisible’ modes from the Sudbury Neutrino Observatory*, Phys. Rev. Lett. **92**, 102004 (2004) [hep-ex/0310030].
- R.A. Scalzo *et al.* (STACEE collaboration), *High-energy gamma-ray observations of W Comae with STACEE*, Astrophys. J. **607**, 778 (2004) [astro-ph/0403114].

Instrumentation/Accelerator Physics/Computing Sciences

M. Craddock, *The rebirth of the FFAG*, CERN Courier **44**(6), 23 (2004).

S. Koscielniak and C. Johnstone, *Mechanisms for non-linear acceleration in FFAGs with fixed rf*, Nucl. Instrum. Methods **A523**, 25 (2004).

M.S. Dixit, J. Dubeau, J.-P. Martin and K. Sachs, *Position sensing from charge dispersion in micro-pattern gas detectors with a resistive anode*, Nucl. Instrum. Methods **A518**, 721 (2004) [physics/0307152].

Ch. Rauth, Ch. Geppert, R. Horn, J. Lassen, P.G. Bricault and K. Wendt, *First laser ions at an off-line mass separator of the ISAC facility at TRIUMF*, Nucl. Instrum. Methods **B215**, 268 (2004).

Ch. Geppert, P. Bricault, R. Horn, J. Lassen, Ch. Rauth and K. Wendt, *Resonance ionization laser ion source – off-line tests at TRIUMF*, Nucl. Phys. **A746**, 631c (2004).

J. Baggio, V. Ferlet-Cavrois and O. Flament, *Comparison of SER test methods for commercial SRAMs*, IEEE Trans. Nucl. Sci. **51** (2004).

J.R. Schwank, P.E. Dodd, M.R. Shaneyfelt, G.L. Hash, V. Ferlet-Cavrois, P. Paillet and J. Baggio, *Issues for single-event proton testing of ICs*, IEEE Trans. Nucl. Sci. **51** (2004).

C. Cojocaru *et al.* (ATLAS Liquid Argon EMEC/HEC collaboration), *Hadronic calibration of the ATLAS liquid argon end-cap calorimeter in the pseudorapidity region 1.6*

$\langle |\eta| \rangle < 1.8$ in beam tests, Nucl. Instrum. Methods **A531**, 481 (2004) [MPP-2004-81, physics/0407009].

D. Binosi and L. Theussl, *JaxoDraw: A graphical user interface for drawing Feynman diagrams*, Comput. Phys. Commun. **161**, 76 (2004) [FTUV-03-0902, hep-ph/0309015].

Molecular and Materials Science

K.M. Kojima, J. Yamanobe, H. Eisaki, S. Uchida, Y. Fudamoto, I.M. Gat, M.I. Larkin, A. Savici, Y.J. Uemura, P.P. Kyriakou, M.T. Rovers and G.M. Luke, *Site-dilution in quasi one-dimensional antiferromagnet $Sr_2(Cu_{1-x}Pd_x)O_3$: reduction of Néel temperature and spatial distribution of ordered moment sizes*, Phys. Rev. **B70**, 094402 (2004).

R.L. Lichti, W.A. Nussbaum and K.H. Chow, *Hyperfine spectroscopy of muonium in 4H and 6H silicon carbide*, Phys. Rev. **B70**, 165204-1 (2004).

V.G. Storchak, D.G. Eshchenko and J.H. Brewer, *Formation and dynamics of muonium centres in semiconductors – a new approach*, J. Phys. Condens. Matter **16**, 4761 (2004).

J.E. Sonier, K.F. Poon, G.M. Luke, P. Kyriakou, R.I. Miller, R. Liang, C.R. Wiebe, P. Fournier and R.L. Greene, *Field-induced antiferromagnetic order in $Pr_{2-x}Ce_xCuO_4$* , Physica **C408-10**, 783 (2004).

W. Higemoto, K. Ohishi, A. Koda, S.R. Saha, R. Kadono, K. Ishida, K. Takada, H. Sakurai, E. Takayama-Muromachi and T. Sasaki, *Possible unconventional superconductivity in $Na_xCoO_2 \cdot yH_2O$ probed by muon spin rotation and relaxation*, Phys. Rev. **B70**, 134508 (2004).

R. Kadono, W. Higemoto, A. Koda, M.I. Larkin, G.M. Luke, A.T. Savici, Y.J. Uemura, K.M. Kojima, T. Okamoto, T. Kakeshita, S. Uchida, T. Ito, K. Oka, M. Takigawa, M. Ichioka and K. Machida, *Expansion of vortex cores by strong electronic correlation in $La_{2-x}Sr_xCuO_4$ at low magnetic induction*, Phys. Rev. **B69**, 104523 (2004).

R. Kadono, K. Ohishi, A. Koda, W. Higemoto, K.M. Kojima, S. Kuroshima, M. Fujita and K. Yamada, *Strong correlation between field-induced magnetism and superconductivity in $Pr_{0.89}LaCe_{0.11}CuO_4$* , J. Phys. Soc. Jpn. **73**, 2944 (2004).

S. Kuroiwa, H. Takagiwa, M. Yamazawa, J. Akimitsu, K. Ohishi, A. Koda, W. Higemoto and R. Kadono, *Unconventional behavior of field-induced quasiparticle excitation in $Ca(Al_{0.5}Si_{0.5})_2$* , J. Phys. Soc. Jpn. **73**, 2631 (2004).

A. Koda, R. Kadono, W. Higemoto, K. Ohishi, H. Ueda, C. Urano, S. Kondo, M. Nohara and H. Takagi, *Spin fluctuation in LiV_2O_4 studied by muon spin relaxation*, Phys. Rev. **B69**, 012402 (2004).

S. Hirano, J. Sugiyama, T. Noritake and T. Tani, *Chemical pressure effect on magnetic properties in electron-doped Perovskite manganites $(Gd_{0.08}Ca_ySr_{0.92-y})MnO_3$*

$(0 \leq y < 1)$: percolation transition of ferromagnetic clusters, Phys. Rev. **B70**, 094419 (2004).

J. Sugiyama, J.H. Brewer, E.J. Ansaldo, B. Hitti, M. Mikami, Y. Mori and T. Sasaki, *Electron correlation in the two-dimensional triangle lattice of Na_xCoO_2* , Phys. Rev. **B69**, 214423 (2004).

D.E. MacLaughlin, R.H. Heffner, O.O. Bernal, K. Ishida, J.E. Sonier, G.J. Nieuwenhuys, M.B. Maple and G.R. Stewart, *Disorder, inhomogeneity and spin dynamics in f-electron non-Fermi liquid systems*, J. Phys. Condens. Matter **16**, S4479 (2004).

J.E. Sonier, *Investigations of the core structure of magnetic vortices in type-II superconductors using muon spin rotation*, J. Phys. Condens. Matter **16**, S4499 (2004).

J.E. Sonier, F.D. Callaghan, R.I. Miller, E. Boaknin, L. Taillefer, R.F. Kiefl, J.H. Brewer, K.F. Poon and J.D. Brewer, *Shrinking magnetic vortices in V_3Si due to delocalized quasiparticle core states: confirmation of the microscopic theory for interacting vortices*, Phys. Rev. Lett. **93**, 017002 (2004).

D.R. Harshman, W.J. Kossler, X. Wan, A.T. Fiory, A.J. Greer, D.R. Noakes, C.E. Stronach, E. Koster and J.D. Dow, *Nodeless pairing state in single-crystal $YBa_2Cu_3O_7$* , Phys. Rev. **B69**, 174505 (2004).

J. Sugiyama, J.H. Brewer, E.J. Ansaldo, H. Itahara, T. Tani, M. Mikami, Y. Mori, T. Sasaki, S. Hébert and A. Maignan, *Dome-shaped magnetic phase diagram of thermoelectric layered cobaltites*, Phys. Rev. Lett. **92**, 017602 (2004).

Life Sciences

S.R. Bayly, C.L. Fisher, T. Storr, M.J. Adam and C. Orvig, *Carbohydrate conjugates for molecular imaging and radiotherapy: $^{99m}Tc(I)$ and $^{186}Re(I)$ tricarbonyl complexes of $N-(2'-hydroxybenzyl)-2-amino-2-deoxy-D-glucose$* , Bioconjugate Chemistry **15**, 923 (2004).

K.R. Buckley, S. Jivan and T.J. Ruth, *Improved yields for the in situ production of $[^{11}C]CH_4$ using a niobium target chamber*, Nucl. Med. Biology **31**, 825 (2004).

A.R. Studenov, S. Jivan, M.J. Adam, T.J. Ruth and K.R. Buckley, *Studies of the mechanism of the in-loop synthesis of pharmaceuticals*, Appl. Radiat. Isot. **61**, 1195 (2004).

A. Rahmim, M. Lenox, A.J. Reader, C. Michel, Z. Burbar, T.J. Ruth and V. Sossi, *Statistical list-mode image reconstruction for the high resolution research tomograph*, Phys. Med. Biol. **49**, 4239 (2004).

A. Rahmim, P. Bloomfield, S. Houle, M. Lenox, C. Michel, K.R. Buckley, T.J. Ruth and V. Sossi, *Motion correction in histogram-mode and list-mode EM reconstruction: beyond the event-driven approach*, IEEE Trans. Nucl. Sci. **51**, 2588 (2004).

H. Zaidi and V. Sossi, *Point-counterpoint: correction for image degrading factors is essential for accurate quantification of brain function using PET*, Med. Phys. **31**, 423 (2004).

R. de la Fuente-Fernández, V. Sossi, Z. Huang, S. Furtado, J.-Q. Lu, D.B. Calne, T.J. Ruth and A.J. Stoessl, *Levodopa-induced changes in synaptic dopamine levels increase with progression of Parkinson's disease: implications for Dyskinesias*, Brain **127**, 2747 (2004).

C.S. Lee, M. Schulzer, R. de la Fuente-Fernández, E. Mak, L. Kurtamoto, V. Sossi, T.J. Ruth, D.B. Calne and A.J. Stoessl, *Lack of regional selectivity during the progression in Parkinson's disease: implications for pathogenesis*, Ann. Neurol. **61**, 1920 (2004).

V. Sossi, R. de la Fuente-Fernández, J.E. Holden, M. Schulzer, T.J. Ruth and A.J. Stoessl, *Changes of dopamine turnover in the progression of Parkinson's disease as measured by positron emission tomography: their relation to disease-compensatory mechanisms*, J. Cereb. Blood Flow & Metab. **24**, 869 (2004).

D.J. Doudet and J.E. Holden, *[¹¹C]raclopride PET studies of dopamine release by amphetamine: dependence on presynaptic integrity*, Biol. Psychiat. **54**, 1193 (2004).

D.T. Britto, T.J. Ruth, S. Lapi and H.J. Kronzucker, *Cellular and whole-plant chloride dynamics in barley: insights into chloride-nitrogen interactions and salinity responses*, Planta **218**, 615 (2004).

S.E. Unkles, R. Wang, Y. Wang, A.D.M. Glass, N. Crawford and J.R. Kinghorn, *Nitrate reductase is required for nitrate uptake into fungal but not plant cells*, J. Biol. Chem. **279**, 28182 (2004).

Theoretical Program

D. Baye and J.-M. Sparenberg, *Inverse scattering with supersymmetric quantum mechanics (Topical Review)*, J. Phys. **A37**, 10223 (2004).

P.C. de Holanda, W. Liao and A.Yu. Smirnov, *Toward precision measurements in solar neutrinos*, Nucl. Phys. **B702**, 307 (2004) [hep-ph/0404042].

P. Capel, G. Goldstein and D. Baye, *Time-dependent analysis of the breakup of ¹¹Be on ¹²C at 67 MeV/nucleon*, Phys. Rev. **C70**, 064605 (2004).

K. Tsushima and F.C. Khanna, *Λ_c^+ , Σ_c , Ξ_c and Λ_b hypernuclei in the meson-quark coupling model*, J. Phys. **G30**, 1765 (2004) [Alberta THy 07-03].

J. Ho, F.C. Khanna and B.C. Choi, *Dynamical invariant method and radiation-spin interaction to calculate magnetisation damping*, Phys. Rev. **B70**, 172402 (2004).

E.S. Santos, M. Montigny, F.C. Khanna and A.E. Santana, *Gauge covariant Lagrangian models*, J. Phys. **A37**, 9771 (2004).

G. Gour, F.C. Khanna, A. Mann and M. Revzen, *Optimization of Bell's inequality violation for continuous variable systems*, Phys. Lett. **A324**, 415 (2004).

J. Ho, F.C. Khanna and B.C. Choi, *Radiation-spin interaction, Gilbert damping and spin torque*, Phys. Rev. Lett. **92**, 097601 (2004).

M.D. Oliviera, M.C.B. Fernandes, F.C. Khanna, A. Santana and J.D.M. Vianna, *Symplectic quantum mechanics*, Ann. Phys. **312**, 492 (2004).

G. Gour, F.C. Khanna and M. Revzen, *Self adjoint extensions of phase and time operators*, Phys. Rev. **A69**, 014101 (2004).

M. Kobayashi, F.C. Khanna, M. Revzen, A. Mann and A. Santana, *Maximal Bell's inequality violation for non-maximal entanglement*, Phys. Lett. **A323**, 190 (2004).

W.-F. Chang and J.N. Ng, *Phenomenology of a 5-D orbifold SU(3)(W) unification model*, Phys. Rev. **D69**, 056005 (2004) [hep-ph/0312199].

T. Gorringer and H.W. Fearing, *Induced pseudoscalar coupling of the proton weak interaction*, Rev. Mod. Phys. **76**, 31 (2004) [TRI-PP-02-08, nucl-th/0206039].

B. Desplanques and L. Theussl, *Form factors in the 'point form' of relativistic quantum mechanics: single and two-particle currents*, Eur. Phys. J. **A21**, 93 (2004) [LPSC-03-15, hep-ph/0307028].

L. Theussl, S. Noguera and V. Vento, *Generalized parton distributions of the pion in a Bethe-Salpeter approach*, Eur. Phys. J. **A20**, 483 (2004) [nucl-th/0211036].

G. Huey, R.H. Cyburt and B.D. Wandelt, *Precision primordial ⁴He measurement from the CMB*, Phys. Rev. **D69**, 103503 (2004) [astro-ph/0307080].

R.H. Cyburt, B.D. Fields and K.A. Olive, *Solar neutrino constraints on the BBN production of Li*, Phys. Rev. **D69**, 123519 (2004) [astro-ph/0312629].

C.Q. Geng, I.-L. Ho and T.H. Wu, *Axial-vector form factors for $K_{12\gamma}$ and $\pi_{12\gamma}$ at $\mathcal{O}(p^6)$ in chiral perturbation theory*, Nucl. Phys. **B684**, 281 (2004) [hep-ph/0306165].

B. Davids and S. Typel, *Reply to comment on electromagnetic dissociation of ⁸B and the astrophysical S factor for ⁷Be(p, γ)⁸B*, Phys. Rev. **C70**, 039802 (2004).

C. Barbieri and L. Lapikas, *Effects of rescattering in (ee'p) reactions within a semiclassical model*, Phys. Rev. **C70**, 054612 (2004) [TRI-PP-04-15, nucl-th/0409032].

R. Allahverdi, R. Brandenberger and A. Mazumdar, *Enhanced reheating via Bose condensates*, Phys. Rev. **D70**, 083535 (2004) [TRI-PP-04-12, hep-ph/0407230].

P.H. Beauchemin, G. Azuelos and C.P. Burgess, *Dimensionless coupling of bulk scalars at the LHC*, J. Phys. **G30**, N17 (2004) [MCGILL-04-12, ATL-COM-PHYS-2004-031, hep-ph/0407196].

- B.K. Jennings and K. Maltman, *Z* resonances: phenomenology and models*, Phys. Rev. **D69**, 094020 (2004) [YU-PP-I-E-03-KM-3, hep-ph/0308286].
- C.B. Das, S. Das Gupta and B.K. Jennings, *Grand canonical model predictions for nuclear fragmentation*, Phys. Rev. **C70**, 044611 (2004) [nucl-th/0406073].
- R.H. Cyburt, B. Davids and B.K. Jennings, *Determination of $S_{17}(0)$ from published data*, Phys. Rev. **C70**, 045801 (2004) [nucl-th/0406011].
- Y. Fujiwara, K. Miyagawa, M. Kohno, Y. Suzuki, D. Baye and J.-M. Sparenberg, *Faddeev calculations of 3α and $\alpha\alpha A$ systems using $\alpha\alpha$ resonating-group method kernel*, Phys. Rev. **C70**, 024002 (2004) [nucl-th/0404071].
- Y. Fujiwara, M. Kohno, K. Miyagawa, Y. Suzuki and J.-M. Sparenberg, *Faddeev calculation of ${}^6_{\Lambda\Lambda}\text{He}$ using SU_6 quark-model baryon-baryon interactions*, Phys. Rev. **C70**, 037001 (2004) [nucl-th/0405056].
- R. Allahverdi, *Scenarios of modulated perturbations*, Phys. Rev. **D70**, 043507 (2004) [TRI-PP-04-06, astro-ph/0403351].
- J.-M. Sparenberg, *Clarification of the relationship between bound and scattering states in quantum mechanics: application to ${}^{12}\text{C} + \alpha$* , Phys. Rev. **C69**, 034601 (2004).
- C.P. Liu, C.H. Hyun and B. Desplanques, *Parity nonconservation in the photodisintegration of the deuteron at low energy*, Phys. Rev. **C69**, 065502 (2004) [nucl-th/0403009].
- S. Ando, H.W. Fearing, V. Gudkov, K. Kubodera, F. Myhrer, S. Nakamura and T. Sato, *Neutron beta decay in effective field theory*, Phys. Lett. **B595**, 250 (2004) [TRI-PP-04-05, USC-NT-04-04, nucl-th/0402100].
- C. Barbieri, C. Giusti, G.D. Pacati and W.H. Dickhoff, *Effects of nuclear correlations on the ${}^{16}\text{O}(e, e'pN)$ reactions to discrete final states*, Phys. Rev. **C70**, 014606 (2004) [TRI-PP-04-04, nucl-th/0402081].
- W.H. Dickhoff and C. Barbieri, *Self-consistent Green's function method for nuclei and nuclear matter*, Prog. Part. Nucl. Phys. **52**, 377 (2004) [TRI-PP-03-40, nucl-th/0402034].
- F. Okiharu and R.M. Woloshyn, *An alternate smearing method for Wilson loops in lattice QCD*, Eur. Phys. J. **C35**, 537 (2004) [hep-lat/0402009].
- R. Allahverdi and M. Drees, *Leptogenesis from a sneutrino condensate revisited*, Phys. Rev. **D69**, 103522 (2004) [TRI-PP-04-01, hep-ph/0401054].
- R. Allahverdi and M. Drees, *Leptogenesis as the source of gravitino dark matter and density perturbations*, Phys. Rev. **D70**, 123522 (2004) [TRI-PP-04-14, hep-ph/0408289].
- R.H. Cyburt, *Primordial nucleosynthesis for the new cosmology: determining uncertainties and examining concordance*, Phys. Rev. **D70**, 023505 (2004) [astro-ph/0401091].
- D.H. Wilkinson, *Super-allowed Fermi beta-decay: a further visit*, Nucl. Instrum. Methods **A526**, 386 (2004) [TRI-PP-03-41].
- R. Allahverdi, C. Bird, S.G. Nibbelink and M. Pospelov, *Cosmological bounds on large extra dimensions from non-thermal production of Kaluza-Klein modes*, Phys. Rev. **D69**, 045004 (2004) [TRI-PP-03-07, UVIC-TH-05-03, hep-ph/0305010].
- N. Knecht, Z. Papandreou, G.J. Lolos, K. Benslama, G.M. Huber, S. Li, V. Bekrenev, W.J. Briscoe, D. Grosnick, D. Isenhower, D.D. Koetke, N.G. Kozlenko, S. Kruglov, D.M. Manley, R. Manweiler, S. McDonald, J. Olmsted, A. Shafi and T.D.S. Stanislaus, *Relative branching ratio of the $\eta \rightarrow \pi^0 \gamma \gamma$ decay channel*, Phys. Lett. **B589**, 14 (2004).

Journal Publications In Press or Submitted

Particle, Nuclear and Atomic Physics

- M. Agnello, G. Beer, L. Benussi, M. Bertani, S. Bianco, E. Botta, T. Bressani, L. Busso, D. Calvo, P. Camerini, P. Cerello, B. Dalena, F. De Mori, A. D'Erasmus, D. Di Santo, F.L. Fabbri, D. Faso, A. Feliciello, A. Filippi, V. Filippini, R. Fini, E.M. Fiore, H. Fujioka, P. Gianotti, N. Grión, V. Lucherini, S. Marcello, T. Maruta, N. Mirfakhrai, O. Morra, T. Nagae, A. Olin, H. Outa, E. Pace, M. Pallotta, M. Palomba, A. Pantaleo, A. Panzarasa, V. Paticchio, S. Piano, F. Pompili, R. Rui, G. Simonetti, H. So, S. Tomassini, A. Toyoda, R. Wheadon and A. Zenoni, *Evidence for a kaon-bound state $K^- pp$ produced in K^- absorption reactions at rest* (Phys. Rev. Lett., in press).
- M. Agnello, G. Beer, L. Benussi, M. Bertani, H.C. Bhang, S. Bianco, E. Botta, T. Bressani, M. Bregant, L. Busso, D. Calvo, P. Camerini, P. Cerello, B. Dalena, F. De Mori, A. D'Erasmus, D. Di Santo, R. Dona, D. Elia, F.L. Fabbri, D. Faso, A. Feliciello, A. Filippi, V. Filippini, E.M. Fiore, H. Fujioka, P. Gianotti, N. Grión, V. Lucherini, S. Marcello, T. Maruta, N. Mirfakhrai, O. Morra, T. Nagae, A. Olin, H. Outa, E. Pace, M. Pallotta, M. Palomba, A. Pantaleo, A. Panzarasa, V. Paticchio, S. Piano, F. Pompili, R. Rui, G. Simonetti, H. So, S. Tomassini, A. Toyoda, R. Wheadon and A. Zenoni, *First results on ${}^{\Lambda^2}\text{C}$ production at DAΦNE* (Phys. Lett. B, in press).
- T. Warner, G. Ball, J.A. Behr, T.E. Chupp, P. Finlay, G. Hackman, M.E. Hayden, B. Hyland, K. Koopmans, S.R. Nuss-Warren, M.R. Pearson, A.A. Phillips, M.A. Schumaker, M.B. Smith, C.E. Svensson and E.R. Tardiff, *Diffusion of Xe in Zr, Ta, and Pt* (submitted to Nucl. Instrum. Methods A).
- Y. Hirayama, T. Shimoda, H. Izumi, A. Hatakeyama, K.P. Jackson, C.D.P. Levy, H. Miyatake, M. Yagi and H. Yano, *Structure of ${}^{11}\text{Be}$ studied in β -delayed decays from polarized ${}^{11}\text{Li}$* (Phys. Lett. B, in press).
- W.S. Wilburn, J.D. Bowman, S.I. Penttila, M.T. Gericke, *A low-noise current-mode preamplifier for gamma asymmetry measurements* (Nucl. Instrum. Methods A, in press).

- B. Davids and C.N. Davids, *EMMA: a recoil mass spectrometer for ISAC-II at TRIUMF* (Nucl. Instrum. Methods A, in press).
- A. Mills, J.A. Behr, L.A. Courneyea and M.R. Pearson, *Lifetime of the potassium $5P_{1/2}$ state* (submitted to Phys. Rev. A).
- H.C. Scraggs, C.J. Pearson, G. Hackman, M.B. Smith, R.A.E. Austin, G.C. Ball, A.J. Boston, P. Bricault, R.S. Chakravarthy, R. Churchman, N. Cowan, G. Cronkhite, E.S. Cunningham, T.E. Drake, P. Finlay, P.E. Garrett, G.F. Grinyer, B. Hyland, B. Jones, J.R. Leslie, J.-P. Martin, D. Morris, A.C. Morton, A.A. Phillips, F. Sarazin, M.A. Schumaker, C.E. Svensson, J.J. Valiente-Dobón, J.C. Waddington, L.M. Watters and L. Zimmerman, *TIGRESS highly-segmented high-purity germanium clover detector* (Nucl. Instrum. Methods A, in press) [TRI-PP-04-23].
- C.E. Svensson, G. Hackman, C.J. Pearson, M.A. Schumaker, H. Scraggs, M.B. Smith, C. Andreoiu, A. Andreyev, R.A. Austin, G.C. Ball, A.J. Boston, R.S. Chakravarthy, R. Churchman, N. Cowan, T.E. Drake, P. Finlay, P.E. Garrett, G.F. Grinyer, B. Hyland, B. Jones, J.P. Martin, A.C. Morton, A.A. Phillips, R. Roy, F. Sarazin, N. Starinsky, J.J. Valiente-Dobon, J.C. Waddington and L.M. Watters, *Position sensitivity of the TIGRESS 32-fold segmented HPGE clover detector* (Nucl. Instrum. Methods A, in press).
- J.R. Musser, R. Bayes, Yu.I. Davydov, P. Depommier, J. Doornbos, W. Faszer, C.A. Gagliardi, A. Gaponenko, D.R. Gill, P. Green, P. Gumplinger, M.D. Hasinoff, R.S. Henderson, J. Hu, B. Jamieson, P. Kitching, D.D. Koetke, A.A. Krushinsky, Yu.Yu. Lachin, J.A. Macdonald, R.P. MacDonal, G.M. Marshall, E.L. Mathie, L.V. Miasoedov, R.E. Mischke, P.M. Nord, K. Olchanski, A. Olin, R. Openshaw, T.A. Porcelli, J.-M. Poutissou, R. Poutissou, M.A. Quraan, N.L. Rodning, V. Selivanov, G. Sheffer, B. Shin, F. Sobratee, T.D.S. Stanislaus, R. Tacik, V.D. Torokhov, R.E. Tribble, M.A. Vasiliev and D.H. Wright (TWIST collaboration), *Measurement of the Michel parameter ρ in muon decay* (Phys. Rev. Lett., in press) [TRI-PP-04-21, hep-ex/0409063].
- D. Bryman, *Further study of the decay $K^+ \rightarrow \pi\nu$* (in press) [TRI-PP-04-08].
- A. Gorelov, D. Melconian, W.P. Alford, D. Ashery, G. Ball, J.A. Behr, P.G. Bricault, J.M. D'Auria, J. Deutsch, J. Dilling, M. Dombisky, P. Dubé, J. Fingler, U. Giesen, F. Glück, S. Gu, O. Häusser, K.P. Jackson, B.K. Jennings, M.R. Pearson, T.J. Stocki, T.B. Swanson and M. Trinczek, *Scalar interaction limits from the $\beta - \nu$ correlation of trapped radioactive atoms* (Phys. Rev. Lett., in press) [TRI-PP-04-27, nucl-ex/0412032].
- M.T. Gericke, C. Blessinger, J.D. Bowman, R.C. Gillis, J. Hartfield, T. Ino, M. Leuschner, Y. Masuda, G.S. Mitchell, S. Muto, H. Nann, S.A. Page, S.I. Penttilä, W.D. Ramsay, P.-N. Seo, W.M. Snow, J. Tasson and W.S. Wilburn, *A current mode detector array for gamma-ray asymmetry measurements* (Nucl. Instrum. Methods, in press) [LA-UR-1055, nucl-ex/0411022].
- A. Gaponenko, R. Bayes, Yu.I. Davydov, P. Depommier, J. Doornbos, W. Faszer, M.C. Fujiwara, C.A. Gagliardi, D.R. Gill, P. Green, P. Gumplinger, M.D. Hasinoff, R.S. Henderson, J. Hu, B. Jamieson, P. Kitching, D.D. Koetke, A.A. Krushinsky, Yu.Yu. Lachin, J.A. Macdonald, R.P. MacDonal, G.M. Marshall, E.L. Mathie, L.V. Miasoedov, R.E. Mischke, J.R. Musser, P.M. Nord, M. Nozar, K. Olchanski, A. Olin, R. Openshaw, T.A. Porcelli, J.-M. Poutissou, R. Poutissou, M.A. Quraan, N.L. Rodning, V. Selivanov, G. Sheffer, B. Shin, F. Sobratee, T.D.S. Stanislaus, R. Tacik, V.D. Torokhov, R.E. Tribble, M.A. Vasiliev and D.H. Wright, *Measurement of the muon decay parameter δ* (Phys. Rev. D, in press) [TRI-PP-04-22, hep-ex/0410045].
- G. Azuelos, P.H. Beauchemin and C.P. Burgess, *Phenomenological constraints on extra dimensional scalars* (J. Phys. G, in press) [MCGILL-03-17].
- A. Airapetian *et al.* (HERMES collaboration), *Quark helicity distributions in the nucleon for up, down, and strange quarks from semi-inclusive deep-inelastic scattering* (Phys. Rev. D, in press) [DESY-04-107, hep-ex/0407032].
- A. Airapetian *et al.* (HERMES collaboration), *The HERMES polarized hydrogen and deuterium gas target in the HERA electron storage ring* (Nucl. Instrum. Methods A, in press) [DESY-04-128, physics/0408137].
- A. Airapetian *et al.* (HERMES collaboration), *Single-spin asymmetries in semi-inclusive deep-inelastic scattering on a transversely polarized hydrogen target* (Phys. Rev. Lett., in press) [DESY-04-141, hep-ex/0408013].
- A. Airapetian *et al.* (HERMES collaboration), *Search for an exotic $S = -2$, $Q = -2$ baryon resonance at a mass near 1862 MeV in quasi-real photoproduction* (Phys. Rev. D, in press) [DESY-04-239, hep-ex/0412027].
- E. Aliu *et al.* (K2K collaboration), *Evidence for muon neutrino oscillation in an accelerator-based experiment* (Phys. Rev. Lett., in press) [hep-ex/0411038].
- G. Abbiendi *et al.* (OPAL collaboration), *Flavor independent h^0A^0 search and two Higgs doublet model interpretation of neutral Higgs boson searches at LEP* (Eur. Phys. J. C, in press) [CERN-PH-EP-2004-039, hep-ex/0408097].
- G. Abbiendi *et al.* (OPAL collaboration), *Search for radions at LEP2* (Phys. Lett. B, in press) [CERN-PH-EP-2004-041, hep-ex/0410035].
- G. Abbiendi *et al.* (OPAL collaboration), *Measurement of event shape distributions and moments in $e^+e^- \rightarrow$ hadrons at 91-209 GeV and a determination of α_s* (Eur. Phys. J. C, in press) [CERN-PH-EP-2004-044, hep-ex/0503051].
- G. Abbiendi *et al.* (OPAL collaboration), *Measurement of R_b in e^+e^- collisions at 182-209 GeV* (Phys. Lett. B, in press) [CERN-PH-EP-2004-051, hep-ex/0410034].

Instrumentation/Accelerator Physics/Computing Sciences

J. Lassen, P. Bricault, M. Dombsky, J.P. Lavoie, Ch. Gépert, K. Wendt, *TRIUMF resonant ionization laser ion source project* (submitted to Hyp. Int.).

Yu.I. Davydov, R. Openshaw, V. Selivanov and G. Sheffer, *Gas gain on single wire chambers filled with pure isobutane at low pressure* (submitted to Elsevier) [physics/0410004].

Yu.I. Davydov, *On the first Townsend coefficient at high electric field* (submitted to Elsevier) [TRI-PP-04-09, physics/0409156].

R.S. Henderson, Yu.I. Davydov, W. Faszer, D.D. Koetke, L.V. Miasoedov, R. Openshaw, M.A. Quraan, J. Schaapman, V. Selivanov, G. Sheffer, T.D.S. Stanislaus and V. Torokhov, *Precision planar drift chambers and cradle for the TWIST muon decay spectrometer* (Nucl. Instrum. Methods, in press) [TRI-PP-04-20, hep-ex/0409066].

R. Sturrock *et al.* (ATLAS DC1 Task Force collaboration), *A step towards a computing grid for the LHC experiments: ATLAS data challenge 1* (submitted to Nucl. Instrum. Methods) [CERN-PH-EP-2004-028].

R.K. Carnegie, M.S. Dixit, J. Dubeau, D. Karlen, J.P. Martin, H. Mes and K. Sachs, *Resolution studies of cosmic ray tracks in a TPC with GEM readout* (Nucl. Instrum. Methods A, in press) [physics/0402054].

Molecular and Materials Science

J.H. Brewer, A.M. Froese, B.A. Fryer and K. Ghandi, *Relativistic shifts of bound negative muon precession frequencies* (submitted to Phys. Rev.).

A. Koda, W. Higemoto, K. Ohishi, S.R. Saha, R. Kadono, S. Yonezawa, Y. Muraoka and Z. Hiroi, *Possible anisotropic order parameter in the pyrochlore superconductor KOs_2O_6 probed by muon spin rotation* (J. Phys. Soc. Jpn., in press).

J. Sugiyama, J.H. Brewer, E.J. Ansaldò, J.A. Chakhalian, H. Nozaki, H. Hazama, Y. Ono and T. Kajitani, *Spin state transition in Ca-doped $Na_{0.7}CoO_2$ with the nominal Co valence below 3.16* (submitted to Solid State Commun.).

J. Sugiyama, D. Andreica, H. Itahara and T. Tani, *The effect of pressure on the spin density wave transition in the layered cobaltites $[Ca_2CoO_3]_{0.62}[CoO_2]$ and $[Ca_2Co_{4/3}Cu_{2/3}O_4]_{0.62}[CoO_2]$* (submitted to Solid State Commun.).

J. Sugiyama, H. Nozaki, J.H. Brewer, E.J. Ansaldò, T. Takami, H. Ikuta and U. Mizutani, *Two dimensionality in quasi one-dimensional cobalt oxides* (submitted to Phys. Rev. B).

C. Xia, J. Sugiyama, H. Itahara and T. Tani, *Platelet crystals of thermoelectric layered cobaltites; pure and Sr-doped $[Ca_2CoO_3]_{0.62}[CoO_2]$* (J. Crystal Growth, in press).

J.H. Brewer, K. Ghandi, A.M. Froese and B.A. Fryer, *Negative muon spin precession measurement of the hyperfine*

states of muonic sodium (Phys. Rev. C, in press).

D.R. Noakes, R. Wäppling, G.M. Kalvius, M.F. White Jr. and C.E. Stronach, *Singlet ground-state fluctuations in praseodymium observed by muon spin relaxation in PrP and PrP_{0.9}* (J. Phys. Condens. Matter, in press).

R.F. Kiefl, K.H. Chow, W.A. MacFarlane, C.D.P. Levy and Z. Salman, *Application of low energy spin polarized radioactive ion beams in condensed matter research* (Nucl. Phys. News, in press).

V.G. Storchak, D.G. Eshchenko, J.H. Brewer, B. Hitti, R.L. Lichti and B.A. Aronzon, *Magnetic freezeout of electrons into muonium atoms in GaAs* (Phys. Rev. B, in press).

V.G. Storchak, D.G. Eshchenko, J.H. Brewer, R.L. Lichti, B.A. Aronzon and S.P. Cottrell, *Deep muonium state in InSb: recombination center vs. trapping center* (submitted to Phys. Rev. Lett.).

Life Sciences

R. Mungur, A.D.M. Glass, D.B. Goodenow and D.A. Lightfoot, *Metabolite fingerprinting in transgenic Nicotiana tabacum altered by the Escherichia coli glutamate dehydrogenase* (J. Biomed. Biotech., in press).

V. Sossi, K.R. Buckley, P. Piccioni, A. Rahmim, M-L. Camborde, S. Lapi, E. Strome and T.J. Ruth, *Printed sources for positron emission tomography (PET)* (IEEE Trans. Nucl. Sci., in press).

E.M. Strome, S. Jivan and D.J. Doudet, *Quantitative in-vitro phosphor imaging using $[^3H]$ and $[^{18F}]$ radioligands: the effects of chronic desipramine treatment on serotonin 5-HT₂ receptors* (J. Neurosci. Methods, in press).

V. Sossi, M-L. Camborde, G. Tropini, D. Newport, A. Rahmim, D.J. Doudet and T.J. Ruth, *The influence of measurement uncertainties on the evaluation of the distribution volume ratio and binding potential in rat studies on a microPET[®] R4: a phantom study* (submitted to Phys. Med. Biol.).

Theoretical Program

E. Vogt, *Pervasive and extreme neutron halos* (resubmitted to Phys. Rev. C) [TRI-PP-01-23].

P. Capel and D. Baye, *Coupling-in-the-continuum effects in Coulomb dissociation of halo nuclei* (Phys. Rev. C, in press).

C. Barbieri and B.K. Jennings, *Nucleon-nucleus optical potential in the particle-hole approach* (submitted to Phys. Rev. C) [TRI-PP-04-26, nucl-th-0501072].

D. Wilkinson, *Super-allowed Fermi beta-decay: Vale!* (submitted to Nucl. Instrum. Methods) [TRI-PP-04-17].

K.Y. Wong and R.M. Woloshyn, *Systematics of staggered fermion spectral properties and topology* (Phys. Rev. D, in press) [hep-lat/0412001].

H. Queiroz, J.C. da Silva, F.C. Khanna, J.M.C. Malbouisson, M. Revzen and A.E. Santana, *Thermofield dynamics and Casimir effect for fermions* (Annals Phys., in press) [hep-th/0411228].

C. Barbieri, D. Rohe, I. Sick and L. Lapikas, *Effect of kinematics on final state interactions in (e, e', p) reactions* (Phys. Lett. B, in press) [TRI-PP-04-19, nucl-th/0411066].

W.-F. Chang and J.N. Ng, *Charged lepton electric dipole moments from TeV scale right-handed neutrinos* (New J. Phys., in press) [hep-ph/0411201].

J.L. Fisker, J. Gorres, M. Wiescher and B. Davids, *The importance of $^{15}O(\alpha, \gamma)^{19}Ne$ to X-ray bursts and superbursts* (submitted to Astrophys. J.) [astro-ph/0410561].

R. Allahverdi, A. Jokinen and A. Mazumdar, *Gravitino production from reheating in split supersymmetry* (Phys. Rev. D, in press) [TRI-PP-04-25, NORDITA-2004-80, hep-ph/0410169].

R.H. Cyburt, B.D. Fields, K.A. Olive and E. Skillmann, *New BBN limits on physics beyond the standard model from 4He* (Astropart. Phys., in press) [UMN-TH-2316-04, FTPI-MINN-04-28, astro-ph/0408033].

S. Ando and C.H. Hyun, *Effective field theory on the deuteron with dibaryon field* (submitted to Phys. Rev. C) [TRI-PP-04-10, nucl-th/0407103].

D.U. Matrasulov, F.C. Khanna, U.R. Salomov and A.E. Santana, *Quantum chaos in the Yang-Mills-Higgs system at finite temperature* (Eur. Phys. J., in press) [hep-ph/0306162].

Conference Publications

Particle, Nuclear and Atomic Physics

C. Maggiore, N. Agazaryan, N. Bassler, E. Blackmore, G. Beyer, J.J. DeMarco, M. Doser, C.R. Gruhn, M.H. Holzschneider, T. Ichioka, K.S. Iwamoto, H.V. Knudsen, R. Landua, W.H. McBride, S.P. Meller, J. Petersen, J.B. Smathers, L.D. Skarsgard, T.D. Solberg, U.I. Uggerhoj, H.R. Withers and B.G. Wouters, *Biological effectiveness of antiproton annihilation*, Proc. **7th Int. Conf. on Low-Energy Antiproton Physics (LEAP 03)**, Yokohama, Japan, March 3–7, 2003 (Nucl. Instrum. Methods **B214**, 2004). p.181.

D.S. Armstrong, T.D. Averett, J. Birchall, J.D. Bowman, R.D. Carlini, S. Chattopadhyay, C.A. Davis, J. Doornbos, J.A. Dunne, R. Ent, J. Erler, W.R. Falk, J.M. Finn, T.A. Forest, D.J. Gaskell, K.H. Grimm, C. Hagner, F.W. Hersman, M. Holtrop, K. Johnston, R.T. Jones, K. Joo, C. Keppel, E. Korkmaz, S. Kowalski, L. Lee, A. Lung, D. Mack, S. Majewski, G.S. Mitchell, H. Mkrtchyan, N. Morgan, A.K. Oppen, S.A. Page, S.I. Penttila, M. Pitt, M. Poelker, T. Porcelli, W.D. Ramsay, M.J. Ramsey-Musolf, J. Roche, N. Simicevic, G.R. Smith, R. Suleiman, S. Taylor, W.T.H. van Oers, S.B. Wells, W.S. Wilburn, S.A. Wood and C. Zorn

(Qweak collaboration), *Qweak: a precision measurement of the proton's weak charge*, Proc. **8th Conf. on the Intersections of Particle and Nuclear Physics (CIPANP 2003)**, New York, NY, May 19–24, 2003, ed. Z. Parsa (AIP Conf. Proc. **698**, New York, 2004) p.172 [LA-UR-03-6031, hep-ex/0308049].

C.A. Gagliardi, *TWIST: measuring the space-time structure of muon decay*, *ibid.* 234.

P. Kitching *et al.* (TWIST collaboration), *A precision measurement of μ^+ decay*, Proc. **5th Int. Workshop on Neutrino Factories and Superbeams (NuFact03)**, New York, NY, June 5–11, 2003 (AIP **721**, 2004) p.301.

W.D. Ramsay, *Selected parity violation experiments*, Proc. **Advanced Study Inst. on Symmetries and Spin (SPIN-PRAHA-2003)**, Prague, Czech Republic, July 12–19, 2003 (Czech. J. Phys. **54**, 2004), p.B207 [TRI-PP-04-02, nucl-ex/0401028].

M. Dombisky, P. Bricault and V. Hanemaayer, *Increasing beam currents at the TRIUMF-ISAC facility; techniques and experiences*, Proc. **6th Int. Conf. on Radioactive Nuclear Beams (RNB6)**, Argonne, IL, September 22–26, 2003 (Nucl. Phys. **A746**, 2004) p.32 [TRI-PP-03-35].

Y. Hirayama, T. Shimoda, H. Izumi, H. Yano, M. Yagi, A. Hatakeyama, C.D.P. Levy, K.P. Jackson and H. Miyatake, *Structure of ^{11}Be studied in β -delayed neutron and γ -decay from polarized ^{11}Li* , *ibid.* 71.

C.D.P. Levy, R. Baartman, J.A. Behr, R.F. Kiefl, M. Pearson, R. Poutissou, A. Hatakeyama and Y. Hirayama, *The collinear laser beam line at ISAC*, *ibid.* 206 [TRI-PP-03-36].

D. Hutcheon *et al.* (DRAGON collaboration), *Study of $^{21}Na(p, \gamma)^{22}Mg$ using the DRAGON separator*, *ibid.* 359 [TRI-PP-03-37].

K. Minamisono, K. Matsuta, T. Minamisono, C.D.P. Levy, T. Nagatomo, M. Ogura, T. Sumikama, J.A. Behr and K.P. Jackson, *Quadrupole moments of $^{20, 21}Na$* , *ibid.* 501.

M.B. Smith, P.M. Walker, R.S. Chakravarthy, R.A.E. Austin, G.C. Ball, J.J. Carroll, E. Cunningham, P. Finlay, P.E. Garrett, G.F. Grinyer, G. Hackman, B. Hyland, K. Koopmans, W.D. Kulp, J.R. Leslie, A.A. Phillips, R. Propri, P.H. Regan, F. Sarazin, M.A. Schumaker, H.C. Scraggs, T. Shizuma, C.E. Svensson, J. von Schwarzenberg, J.C. Waddington, D. Ward, J.L. Wood, B. Washbrook and E.F. Zganjar, *Studies of high-K isomers at TRIUMF-ISAC*, *ibid.* 617.

K. Minamisono, K. Matsuta, T. Minamisono, C.D.P. Levy, T. Nagatomo, M. Ogura, T. Sumikama, J.A. Behr, K.P. Jackson, H. Fujiwara, M. Mihara and M. Fukuda, *Alignment correlation term in the β -ray angular distribution from spin aligned ^{20}Na* , *ibid.* 673.

J. Lu *et al.* (HERMES collaboration), *Exclusive deeply inelastic electroproduction at HERMES*, Proc. **3rd Int. Symp.**

on the Gerasimov-Drell-Hearn Sum Rule and its Extensions (GDH 2004), Norfolk, VA, June 2–5, 2004 (Norfolk, 2004) p.216.

M. Agnello *et al.* (FINUDA collaboration), *First results of FINUDA on hypernuclear spectroscopy*, Proc. **Workshop on Physics at Meson Factories (DAΦNE 2004), Frascati, Italy, June 7–11, 2004** (Frascati 2004, DAPHNE 2004) p.189.

M. Agnello *et al.* (FINUDA collaboration), *First observations of hypernuclear non mesonic weak decays with FINUDA*, *ibid.* 195.

M. Agnello *et al.* (FINUDA collaboration), *Search for neutron rich hypernuclei in FINUDA: preliminary results*, *ibid.* 201.

M. Agnello *et al.* (FINUDA collaboration), *Examining sigma-bound states with FINUDA*, *ibid.* 209.

M. Agnello *et al.* (FINUDA collaboration), *Search for deeply-bound kaonic nuclei at FINUDA*, *ibid.* 225.

D.R. Gill (TWIST collaboration) *TWIST: TRIUMF weak interaction symmetry test*, *ibid.* 427.

G. Abbiendi *et al.* (OPAL collaboration), *Multi-photon events with large missing energy in e^+e^- collisions at $\sqrt{s} = 192\text{--}209$ GeV*, Proc. **2nd High-Energy Physics Conf. in Madagascar, Antananarivo, Madagascar, September 27–October 3, 2004** (eConf C0409272:012; Phys. Lett. **B602**, 2004), p.167 [CERN-PH-EP-2004-035, hep-ex/0412011].

Instrumentation/Accelerator Physics/Computing Sciences

T. Yoshioka, M. Nomachi, A. Artamanov, B. Bhuyan, J.S. Frank, T. Fujiwara, K. Higa, S.H. Kettell, T.K. Komatsubara, A. Konaka, A. Kozjevnikov, A. Kushnirenko, N. Muramatsu, T. Nakano, T. Nomura, S. Petrenko, R. Poutissou, G. Redlinger, T. Sekiguchi, T. Shinkawa, S. Sugimoto and T. Tsunemi, *Upgrade of the level-0 trigger system for BNL-E949*, Proc. **13th IEEE – NPSS Real Time Conf. (RT 2003), Montreal, PQ, May 18–23, 2003** (IEEE Trans. Nucl. Sci. **51**, 2004) p.334 [KEK-PREPRINT-2003-109, OULNS-03-02, BNL-71879-2003-JA].

D.M. Gingrich, N.J. Buchanan, S. Liu, S. Boettcher, J.A. Parsons and B.W. Sippach, *Radiation tolerant ASIC for controlling switched-capacitor arrays*, *ibid.* 1324.

R. Poutissou, P.-A. Amaudruz, A. Gaponenko, P. Green, K. Olchanski and A. Olin, *The TWIST data acquisition system at TRIUMF*, *ibid.* [TRI-PP-04-16].

J.B. Jeanneret *et al.*, *Beam loss and collimation in the LHC*, Proc. **29th ICFA Advanced Beam Dynamics Workshop (HALO'03), Montauk, NY, May 19–23, 2003** (AIP **693**, 2004) p.180.

S. Koscielniak and C.J. Johnstone, *Nonlinear acceleration modes in FFAGs with fixed rf*, Proc. **5th Int. Workshop on**

Neutrino Factories and Superbeams (NuFact03), New York, NY, June 5–11, 2003 (AIP **721**, 2004) p.467.

M.J. Barnes and G.D. Wait, *A 25 kV, 75 kHz kicker for measurement of muon lifetime*, Proc. **IEEE Int. Pulsed Power Conf., Dallas, TX, June 15–18, 2003** (IEEE Trans. Plasma Sci. **32**, 2004) p.1932 [TRI-PP-03-28].

M.J. Barnes, G.D. Wait, J. Dilling, J.V. Vaz, L. Blomeley, O. Hadary and M.J. Smith, *A high frequency MOSFET driver for the TITAN facility at TRIUMF*, *ibid.*

K. Jayamanna, D. Yuan, M. Olivo, R. Baartman, G. Dutto, M. McDonald, A. Mitra, P. Schmor and G. Stanford, *Commissioning the TRIUMF/ISAC ECR source for radioactive ion beams*, Proc. **10th Int. Conf. on Ion Sources (ICIS 2003), Dubna, Russia, September 8–13, 2003** (Rev. Sci. Instrum. **75**, 2004) p.1621 [TRI-PP-03-42].

G. Stanford, R.E. Laxdal, C. Marshall, T. Ries and I. Sekatchev, *Design of the medium-beta cryomodule for the ISAC-II superconducting heavy ion accelerator*, Proc. **2003 Cryogenic Engineering Conf. (CEC) and Int. Cryogenic Materials Conf. (ICMC), Anchorage, AL, September 22–26, 2003** (AIP, New York, Advances in Cryo. Eng. **49**, 2004) p.552 [TRI-PP-03-30].

K.S. Lee, E.M. Tikhomolov, J.E. Richards, E. Klassen and T. Tateyama, *TRIUMF secondary beam line control system upgrade using EPICS*, Proc. **IX Int. Conf. on Accelerator and Large Experimental Physics Control Systems (ICALEPCS 2003), Gyeongju, South Korea, October 13–17, 2003** (Pohang Accelerator Laboratory, 2004, ISBN:89-954175-2-8 98420 (CD-ROM)) p.199.

R. Keitel, J. Richards and E. Tikhomolov, *Upgrade of the ISAC device database from Paradox to PostgreSQL*, *ibid.* 202.

J.J. Pon, E. Klassen, K.S. Lee, M.M. Mouat and P.J. Yogendran, *Preliminary use of PDAs in TRIUMF's central control system*, *ibid.* 380.

J.J. Pon, E. Klassen, K.S. Lee, M.M. Mouat and P.J. Yogendran, *Early control system applications using PDAs at TRIUMF*, *ibid.* 383.

G. Waters and R. Nussbaumer, *TRIUMF/ISAC EPICS IOCs using a PC104 platform*, *ibid.* 466.

R. Nussbaumer and G. Waters, *Inexpensive IOCs for GPIB support in the TRIUMF/ISAC control system*, *ibid.* 515.

E. Tikhomolov, G. Waters and R. Keitel, *EPICS portable channel access server for multiple Windows applications*, *ibid.* 518.

M.J. Barnes, G.D. Wait, Y. Shirakabe and Y. Mori, *Conceptual design of a bipolar kicker magnet for the J-PARC-Kamioka neutrino project*, Proc. **18th Int. Conf. on Magnet Technology (MT18), Morioka, Japan, October 20–24, 2003** (IEEE Trans. Applied Superconductivity, 2004) p.465.

M.J. Barnes, E.W. Blackmore, G.D. Wait, J. Lemire-Elmore, B. Rablah, G. Leyh, M. Nguyen and C. Pappas, *Analysis of high power IGBT short circuit failures*, Proc. **26th Int. Power Modulator Symp. and High-Voltage Workshop, San Francisco, CA, May 23–26, 2004** (IEEE conference record, 2004) p.424.

R.W. Assmann, O. Aberle, A. Bertarelli, H.-H. Braun, M. Brugger, L. Bruno, O.S. Brüning, S. Calatroni, E. Chiaveri, B. Dehning, A. Ferrari, B. Goddard, E.B. Holzer, J.-B. Jeanneret, J.M. Jimenez, V. Kain, M. Lamont, M. Mayer, E. Mètral, R. Perret, S. Redaelli, T. Risselada, G. Robert-Demolaize, S. Roesler, F. Ruggiero, R. Schmidt, D. Schulte, P. Sievers, V. Vlachoudis, L. Vos, G. Vossenber, J. Wenninger, I.L. Ajguirei, I. Baishev, I.L. Kurochkin, D. Kaltchev and H. Tsutsui, *An improved collimation system for the LHC*, Proc. **9th European Particle Accelerator Conf. (EPAC 2004), Lucerne, Switzerland, July 5–9, 2004** (EPS Accel. Group, Geneva, 2004) p.536 [EPAC-2004-MOPLT005, CERN-LHC-PROJECT-REPORT-773].

R.W. Assmann, O. Aberle, O.S. Brüning, S. Chemli, D. Gasser, J.-B. Jeanneret, J.M. Jimenez, V. Kain, E. Mètral, G. Peon, S. Ramberger, C. Rathjen, T. Risselada, F. Ruggiero, L. Vos and D. Kaltchev, *The new layout of the LHC cleaning insertions*, *ibid.* 539 [EPAC-2004-MOPLT006, CERN-LHC-PROJECT-REPORT-774].

C. Johnstone and S.R. Koscielniak, *Optimizing non-scaling FFAG lattices for rapid acceleration*, *ibid.* 800 [EPAC-2004-MOPLT112].

M.P. Laverty, S.F. Fang and K. Fong, *TRIUMF ISAC-II rf control system design and testing*, *ibid.* 953 [EPAC-2004-TUPKF002].

A. Facco, W. Lu, F. Scarpa, E. Chiaveri, R. Losito and V. Zviagintsev, *Construction and testing of the beta=0.31, 352 MHz superconducting half-wave resonator for the SPES Project*, *ibid.* 1012 [EPAC-2004-TUPKF022].

A. Facco, W. Lu, F. Scarpa, E. Chiaveri, R. Losito, T.L. Grimm, W. Hartung, F. Marti, R.C. York and V. Zviagintsev, *Construction of a 161 MHz, beta = 0.16 superconducting QWR with steering correction for RIA*, *ibid.* 1015 [EPAC-2004-TUPKF023].

S.R. Koscielniak and M.K. Craddock, *Simple analytic formulae for the properties of non-scaling FFAG lattices*, *ibid.* 1138 [EPAC-2004-TUPLT006].

L. Ahrens, J.M. Brennan, K.A. Brown, J. Glenn, M. Sivertz, N. Tsoupas and S.R. Koscielniak, *Mini-bunched and micro-bunched slow extracted beams from the AGS*, *ibid.* 1544 [EPAC-2004-TUPLT179].

D. Kaltchev, *Building truncated Taylor maps with Mathematica and applications to FFAG*, *ibid.* 1822 [EPAC-2004-WEPLT005].

S.R. Koscielniak, *A comparison of COSY DA maps with analytic formulae for orbit functions of a non-scaling FFAG accelerator*, *ibid.* 2469 [EPAC-2004-THPLT006].

Molecular and Materials Science

J. Sugiyama, J.H. Brewer, E.J. Ansaldo, H. Itahara, K. Dohmae, Y. Seno, C. Xia and T. Tani, *Successive magnetic transitions in thermoelectric layered cobaltite, [Ca₂CoO₃]_{0.62}[CoO₂]*, Proc. **8th IUMRS Int. Conf. on Advanced Materials, Yokohama, Japan, October 8–13, 2003** (Trans. MRS-Japan **29**, 2004) p.2737.

J. Sugiyama, H. Itahara, J.H. Brewer, E.J. Ansaldo, T. Motohashi, M. Karppinen and H. Yamauchi, *Magnetism in Na_{0.75}CoO₂ detected by μ SR*, *ibid.* 2745.

J. Sugiyama, J.H. Brewer, E.J. Ansaldo, B. Hitti, M. Mikami, Y. Mori and T. Sasaki, *μ SR studies on thermoelectric cobalt oxides V: Na_xCoO₂ crystals*, Proc. **Physical Society Japan March Meeting, Fukuoka, Japan, 2004** (Meeting Abstracts Phys. Soc. Jpn. **59**(1), 2004) p.549 (in Japanese).

Life Sciences

M.J. Adam, C.L. Fisher, S.R. Bayly, C.B. Ewart, C. Orvig and S. Lapi, *Synthesis of radiometal complexes of glucose*, Proc. **51st Annual Meeting of the Society of Nuclear Medicine, Philadelphia, PA, June 19–23, 2004** (J. Nucl. Med. **45**, 2004) p.467P.

S. Lu, M.J. Adam, V. Kennedy, J. Lu and T.J. Ruth, *Preparation of iodo-TZDM for PET/SPECT imaging*, *ibid.* 467P.

A.R. Studenov, M.J. Adam, T.J. Ruth and J.S. Wilson, *Exploring new radiolabelling chemistry: synthesis of the compounds with phosphorus-fluorine-18 bonds*, *ibid.* 469P.

Theoretical Program

C. Barbieri, L. Lapikas and D. Rohe, *Rescattering contributions to final state interactions in (e, e'p) reactions*, Proc. **2nd Conf. on Nuclear and Particle Physics with CEBAF at JLab (NAPP 2003), Dubrovnik, Croatia, May 26–31, 2003** (Croatian Phys. Soc. Fizika **B13**, 2004) p.185 [TRI-PP-03-29, nucl-th/0309024].

B. Desplanques, A. Amghar and L. Theussl, *'Point-form' estimate of the pion form factor revisited*, Proc. **17th Int. IUPAP Conf. on Few-Body Problems in Physics (FB 17), Durham, NC, June 5–10, 2003**, eds. W. Gloeckle and W. Tomow (Nucl. Phys. **A737**, 2004) p.3 [hep-ph/0308219].

W.T.H. van Oers, *Symmetries and symmetry breaking*, *ibid.* 267 [TRI-PP-03-27, hep-ph/0307285].

M. de Montigny, F.C. Khanna and A. Santana, *Some Lorentz-like formulation of Galilean invariance*, Proc. **Int. Conf. on Symmetry in Non-Linear Mathematical Physics (SNMP'03), Kyiv, Ukraine, June 23–29, 2003**, eds. A.G. Nikitin *et al.* (Inst. of Mathematics of Ukraine **50**, 2004) p.677.

F. Okiharu and R.M. Woloshyn, *A study of color field distributions in the baryon*, Proc. **21st Int. Symp. on Lattice Field Theory (LATTICE 2003)**, Tsukuba, Ibaraki, Japan, July 15–19, 2003 (Elsevier, Nucl. Phys. Proc. Suppl. **129**, 2004) p.745 [hep-lat/0310007].

C. Barbieri and L. Lapikas, *Rescattering contributions to final state interactions in $(e, e'p)$ reactions at high (p_m, E_m)* , Proc. **6th Workshop on Electromagnetically Induced Two Hadron Emission**, Pavia, Italy, September 24–27, 2003, eds. A. Braghieri, C. Giusti and P. Grabmayr (CD, ISBN:88-85159-20-6, 2004) p.68 [TRI-PP-03-39, nucl-th/0401010].

J.N. Ng, *Neutrino mass models in extra dimensions*, Proc. **2nd Int. Conf. on Flavor Physics (ICFP 2003)**, Seoul, Korea, October 6–11, 2003 (J. Korean Phys. Soc. **45**, 2004) p.S341 [hep-ph/0311352].

J.-M. Sparenberg and B. Jennings, *On the practical interest of one-body overlap functions*, Proc. **Int. Symp.: A New Era of Nuclear Structure Physics**, Niigata, Japan, November 19–22, 2003, eds. Y. Suzuki *et al.* (World Scientific, Singapore, 2004) [nucl-th/0401049].

Y. Fujiwara, K. Miyagawa, M. Kohno, Y. Suzuki, D. Baye and J.-M. Sparenberg, *A realistic baryon-baryon interaction in the SU_6 quark model and its applications to few-body systems*, *ibid.*

J.-M. Sparenberg, *Deducing the asymptotic normalization constant of the 2^+ subthreshold state in ^{16}O from $^{12}C + \alpha$ elastic scattering*, Proc. **8th Int. Conf. on Clustering Aspects of Nuclear Structure and Dynamics (CLUSTER 03)**, Nara, Japan, November 24–29, 2003, eds. K. Ikeda, I. Tanihata and H. Horiuchi (Nucl. Phys. **A738**, 2004) p.416.

Y. Hirayama T. Shimoda, H. Izumi, H. Yano, M. Yagi, A. Hatakeyama, C.D.P. Levy, K.P. Jackson and H. Miyatake, *Spectroscopic study of ^{11}Be through β -delayed neutron- and γ -decays of spin-polarized ^{11}Li* , *ibid.*

Y. Fujiwara, K. Miyagawa, M. Kohno, Y. Suzuki, D. Baye and J.-M. Sparenberg, *A consistent 3α and $2\alpha A$ Faddeev calculation using the 2α RGM kernel*, *ibid.* 495.

Y. Fujiwara, K. Miyagawa, M. Kohno, Y. Suzuki, D. Baye and J.-M. Sparenberg, *$2\alpha A$ Faddeev calculation using the quark-model $S = -2$ hyperon hyperon interaction*, *ibid.*

Conference Presentations

Particle, Nuclear and Atomic Physics

A. Konaka, *The JHFNU experiment and the systematic uncertainties*, Proc. **8th Int. Workshop on Topics in Astroparticle and Underground Physics (TAUP 2003)**, Seattle, WA, September 5–9, 2003 (Nucl. Phys. B138, in press).

M. Agnello, G. Beer, L. Benussi, M. Bertani, S. Bianco, E. Botta, T. Bressani, L. Busso, D. Calvo, P. Camerini,

P. Cerello, B. Dalena, F. De Mori, A. D'Erasmus, D. Di Santo, F.L. Fabbri, D. Faso, A. Feliciello, A. Filippi, V. Filippini, E.M. Fiore, H. Fujioka, P. Gianotti, N. Grion, A. Krasnoperov, V. Lucherini, S. Marcello, T. Maruta, N. Mirfakhrai, O. Morra, A. Olin, E. Pace, M. Pallotta, M. Palomba, A. Pantaleo, A. Panzarasa, V. Patichio, S. Piano, F. Pompili, R. Rui, G. Simonetti, H. So, S. Tomassini, R. Wheadon and A. Zenoni, *First results from the FINUDA experiment at DAΦNE*, Proc. **VIII Int. Conf. on Hypernuclear and Strange Particle Physics**, Newport News, VA, October 14–18, 2003 (Nucl. Phys. A Proc. Suppl., in press) [LNF-03/23].

S. Piano, M. Agnello, G. Beer, L. Benussi, M. Bertani, S. Bianco, E. Botta, T. Bressani, L. Busso, D. Calvo, P. Camerini, P. Cerello, B. Dalena, F. De Mori, A. D'Erasmus, D. Di Santo, F.L. Fabbri, D. Faso, A. Feliciello, A. Filippi, V. Filippini, E.M. Fiore, H. Fujioka, P. Gianotti, N. Grion, A. Krasnoperov, V. Lucherini, S. Marcello, T. Maruta, N. Mirfakhrai, O. Morra, A. Olin, E. Pace, M. Pallotta, M. Palomba, A. Pantaleo, A. Panzarasa, V. Patichio, F. Pompili, R. Rui, G. Simonetti, H. So, S. Tomassini, R. Wheadon and A. Zenoni, *Preliminary results from the FINUDA experiment*, Proc. **XLII Int. Winter Meeting on Nuclear Physics**, Bormio, Italy, January 25–February 1, 2004.

R. MacDonald, *Validating the simulation and response function in TWIST*, Proc. **41st Western Regional Nuclear and Particle Physics Conf. (WRNPPC04)**, Lake Louise, AB, February 13–15, 2004.

A. Olin, *Precision measurement of muon decay*, *ibid.*

B. Jamieson, *Status of the TWIST measurement of $P_\mu\xi$ and systematics*, *ibid.*

R. MacDonald, *Precision measurement of the muon decay spectrum*, Proc. **Lake Louise Winter Institute (LLWI04)**, Lake Louise, AB, February 15–21, 2004 (World Scientific, Singapore, in press).

B. Jamieson, *Estimating P_μ for the TWIST measurement of $P_\mu\xi$* , *ibid.*

S.A. Page, J.D. Bowman, R.D. Carlini, T. Case, T.E. Chupp, K.P. Coulter, M. Dabaghyan, D. Desai, S.J. Freedman, T.R. Gentile, M.T. Gericke, R.C. Gillis, G.L. Greene, F.W. Hersman, T. Ino, S. Ishimoto, G.L. Jones, B. Lauss, M.B. Leuschner, B. Losowski, R. Mahurin, Y. Masuda, G.S. Mitchell, H. Nann, S.I. Penttila, W.D. Ramsay, S. Santra, P.-N. Seo, I.I. Sharapov, T.B. Smith, W.M. Snow, W.S. Wilburn, V. Yuan and H. Zhu, *Measurement of parity violation in np : the NPDGamma experiment*, Proc. **Int. Conf. on Precision Measurements with Slow Neutrons**, Gaithersburg, MD, April 5–7 2004 (NIST J. Research, in press).

M.T. Gericke, J.D. Bowman, R.D. Carlini, T.E. Chupp, K.P. Coulter, M. Dabaghyan, D. Desai, S.J. Freedman, T.R. Gentile, R.C. Gillis, G.L. Greene, F.W. Hersman, T. Ino, S. Ishimoto, G.L. Jones, B. Lauss, M.B. Leuschner, B. Losowski, R. Mahurin, Y. Masuda, G.S. Mitchell, S.

- Muto, H. Nann, S.A. Page, S.I. Penttila, W.D. Ramsay, S. Santra, P.-N. Seo, E.I. Sharapov, T.B. Smith, W.M. Snow, W.S. Wilburn, V. Yuan and H. Zhu, *Commissioning of the NPDGamma detector array: counting statistics in current mode operation and parity violation in the capture of cold neutrons on B_4C and ^{27}Al* , *ibid*.
- S.R. Nuss-Warren, E.R. Tardiff, T. Warner, G. Ball, J.A. Behr, T.E. Chupp, K.P. Coulter, G. Hackman, M.E. Hayden, M.R. Pearson, A.A. Phillips, M.B. Smith and C.E. Svensson, *On-line collection and transfer of radioactive noble gas isotopes for radon EDM measurements*, Proc. **APS April Meeting, Denver, CO, May 1–4, 2004** (Nucl. Instrum. Methods A, in press) [TRI-PP-04-03].
- S.A. Page, *The Q_{weak}^p experiment: a precision search for new physics beyond the standard model via parity violating $e-p$ scattering at low Q^2* , Proc. **From Zero to Z^0 – A Workshop on Precision Electroweak Physics, Fermilab, Batavia, IL, May 12–14, 2004**.
- D. Koetke, *The TRIUMF weak interaction symmetry test*, *ibid*.
- S. Su, *Probing new physics with neutral current measurements*, *ibid*.
- M. Bertani, M. Agnello, G. Beer, L. Benussi, S. Bianco, E. Botta, T. Bressani, L. Busso, D. Calvo, P. Camerini, P. Cerello, B. Dalena, F. De Mori, A. D’Erasmus, D. Di Santo, F.L. Fabbri, D. Faso, A. Feliciello, A. Filippi, V. Filippini, E.M. Fiore, H. Fujioka, P. Gianotti, N. Grion, A. Krasnoperov, V. Lucherini, S. Marcello, T. Maruta, N. Mirfakhrai, O. Morra, A. Olin, E. Pace, M. Pallotta, M. Palomba, A. Pantaleo, A. Panzarasa, V. Paticchio, S. Pivano, F. Pompili, R. Rui, G. Simonetti, H. So, S. Tomassini, R. Wheadon and A. Zenoni, *First results on hypernuclear spectroscopy from the FINUDA experiment at DAΦNE*, Proc. **8th Int. Workshop on Meson Production, Properties and Interaction (MESON04), Kraków, Poland, June 4–8, 2004** (Int. J. Mod. Phys. A, in press).
- K.H. Grimm, *The Q_{weak}^p tracking system. Measurement of the average Q^2 and the dilution by background events*, Proc. **Int. Workshop on Parity Violation and Hadronic Structure (PAVI 2004), Grenoble, France, June 8–11, 2004**.
- G.R. Smith, *Q_{weak}^p , a precision measurement of the proton’s weak charge*, *ibid*.
- M.A. Quraan, *A high precision measurement of muon decay parameters*, Proc. **CAP Congress, Winnipeg, MB, June 13–16, 2004**.
- K. Olchanski, *Data analysis techniques for high precision measurement of muon decay parameters*, *ibid*.
- G.A. Beer *et al.* (FINUDA collaboration), *Hypernuclear physics with FINUDA*, *ibid*.
- A.K. Opper, *The Q_{weak}^p experiment: a search for new physics at the TeV scale via a measurement of the proton’s weak charge*, Proc. **Jefferson Users Group Workshop and Annual Meeting, JLab, Newport News, VA, June 16–18, 2004**.
- K. Minamisono, *Alignment correlation term of ^{20}Na and quadrupole moments of $^{20,21}Na$* , Proc. **Int. Nuclear Physics Conf. (INPC 2004), Göteborg, Sweden, June 27–July 2, 2004** (Nucl. Phys. A, in press).
- M. Agnello, G. Beer, L. Benussi, M. Bertani, S. Bianco, E. Botta, T. Bressani, L. Busso, D. Calvo, P. Camerini, P. Cerello, B. Dalena, F. De Mori, A. D’Erasmus, D. Di Santo, F.L. Fabbri, D. Faso, A. Feliciello, A. Filippi, V. Filippini, E.M. Fiore, H. Fujioka, P. Gianotti, N. Grion, A. Krasnoperov, V. Lucherini, S. Marcello, T. Maruta, N. Mirfakhrai, O. Morra, A. Olin, E. Pace, M. Pallotta, M. Palomba, A. Pantaleo, A. Panzarasa, V. Paticchio, S. Pivano, F. Pompili, R. Rui, G. Simonetti, H. So, S. Tomassini, R. Wheadon and A. Zenoni, *First results from the FINUDA experiment*, *ibid*.
- J. Mildemberger *et al.* (E949 collaboration), *Latest results from the search for $K^+ \rightarrow \pi^+ \nu \bar{\nu}$* , Proc. **6th Int. Conf. on Hyperons, Charm and Beauty Hadrons (BEACH 2004), Chicago, IL, June 27–July 3, 2004** (Nucl. Phys. B, in press).
- L. Buchmann, *Comments on the $^{12}C(\alpha, \gamma)^{16}O$ reaction rate*, Proc. **8th Symp. on Nuclei in the Cosmos (NICVIII), Vancouver, BC, July 19–23, 2004** (Nucl. Phys. A, in press) [TRI-PP-04-35].
- C. Ruiz, M. Aliotta, R.E. Azuma, R.N. Boyd, L. Buchmann, A. Chen, N.M. Clarke, J.M. D’Auria, T. Davinson, B.R. Fulton, D. Groombridge, D. Hutcheon, A.M. Laird, A.S. Murphy, J. Pearson, I. Roberts, A. Robinson, F. Sarazin, A.C. Shotter, P. Walden and P.J. Woods, *Multichannel R-matrix analysis of elastic and inelastic resonances in the $^{20,21}Na+p$ compound systems*, *ibid*. [TRI-PP-04-39].
- G. Ruprecht, K. Czerski, D. Bemmerer, M. Hoefft and P. Heide, *Excitation of giant resonances in deuteron stripping reactions on ^{10}B far below the Coulomb barrier*, *ibid*. [TRI-PP-04-40].
- M. Trinczek, C.C. Jewett, J.M. D’Auria, S. Bishop, L. Buchmann, A.A. Chen, S. Engel, D. Gigliotti, U. Greife, D. Hunter, A. Hussein, D. Hutcheon, J. José, A.M. Laird, M. Lamey, R. Lewis, A. Olin, D. Ottewell, P. Parker, M.M. Pavan, J.E. Pearson, J. Rogers, C. Ruiz and C. Wrede, *Direct measurement of the $^{21}Na(p, \gamma)^{22}Mg$ reaction: resonance strengths and gamma-gamma analysis*, *ibid*. [TRI-PP-04-43].
- S.-M. Chen *et al.* (BNL E949 collaboration), *Rare kaon decay from E949 at BNL: $K^+ \rightarrow \pi^+ \nu \bar{\nu}$* , Proc. **32nd Int. Conf. on High-Energy Physics (ICHEP 04), Beijing, China, August 16–22, 2004** (World Scientific, Hackensack, NJ, in press) [hep-ex/0409064].
- W.T.H. van Oers, *The Qweak experiment*, Proc. **Hall-C Summer Physics Workshop, JLab, Newport News, VA, August 19–20, 2004**.

- A. Sher *et al.* (E865 collaboration), *E865 result: an improved upper limit on the decay $K^+ \rightarrow \pi^+\mu^+e^-$* , Proc. **Annual Meeting of the Division of Particles and Fields (DPF 04)**, Riverside, CA, August 26–31, 2004 (Int. J. Mod. Phys. A, in press).
- R. Tacik *et al.* (CHAOS collaboration), *Low energy pion-nucleon scattering*, Proc. **10th Int. Symp. on Meson-Nucleon Physics and the Structure of the Nucleon (MENU 2004)**, Beijing, China, August 29–September 4, 2004 (Int. J. Mod. Phys., in press).
- H. Fujioka *et al.* (FINUDA collaboration), *Evidence for a kaon-bound state K^-pp produced in K^- absorption reactions at rest*, Proc. **Japan Physical Society Meeting, September, 2004**.
- R.S. Chakrawarthy, P.M. Walker, M.B. Smith, A.N. Andreyev, S.F. Ashley, G.C. Ball, J.A. Becker, J.J. Daoud, P.E. Garrett, G. Hackman, G.A. Jones, Y. Litvinov, A.C. Morton, C.J. Pearson, C.E. Svensson, S.J. Williams and E.F. Zganjar, *Discovery of a new 2.3s isomer in neutron-rich ^{174}Tm* , Proc. **4th Int. Conf. on Exotic Nuclei and Atomic Masses (ENAM04)**, Pine Mountain, GA, September 12–16, 2004 (Eur. Phys. J. A, in press).
- J.A. Behr, A. Gorelov, D. Melconian, M. Trinczek, W.P. Alford, D. Ashery, P.G. Bricault, L. Courneyea, J.M. D’Auria, J. Deutsch, J. Dilling, M. Dombisky, P. Dubé, F. Glück, S. Gryb, S. Gu, O. Häusser, K.P. Jackson, B. Lee, A. Mills, E. Paradis, M.R. Pearson, R. Pitcairn, E. Prime, D. Roberge and T.B. Swanson, *Weak interaction symmetries with atom traps*, *ibid.*
- G. Sikler, J.R. Crespo López-Urrutia, J. Dilling, S. Epp, C.J. Osborne and J. Ullrich, *A high-current EBIT for charge-breeding of radionuclides for the TITAN spectrometer*, *ibid.*
- V.L. Ryjkov, L. Blomeley, M. Brodeur, P. Grothkopp, M. Smith, P. Bricault, F. Buchinger, J. Crawford, G. Gwinner, J. Lee, J. Vaz, G. Werth, J. Dilling and the TITAN collaboration, *TITAN project status report and a proposal for a new cooling method of highly charged ions*, *ibid.*
- M.T. Gericke *et al.*, *A low noise CsI detector array for the precision measurement of parity nonconservation in $\bar{n} + p \rightarrow d + \gamma$* , Proc. **Int. Conf. on Nuclear Data for Science and Technology 2004 (ND2004)**, Santa Fe, NM, September 26–October 1, 2004 (AIP, in press).
- P.N. Seo *et al.*, *The 2004 NPDGamma commissioning run – measurement of parity-violating gamma-ray asymmetries in neutron capture on Al, Cu, Cl, In, and B*, *ibid.*
- P.N. Seo *et al.*, *A new pulsed cold neutron beam for fundamental nuclear physics at LANSCE*, *ibid.*
- R.D. Carlini, *The Q_{weak}^p experiment: a search for new physics beyond the standard model and the TeV scale*, Proc. **16th Int. Spin Symp. (SPIN 2004)**, Trieste, Italy, October 10–16, 2004.
- B. Davids, *EMMA, the proposed recoil separator for ISAC-II*, Proc. **American Physical Society Fall Meeting, Chicago, IL, October 27–30, 2004**.
- Instrumentation/Accelerator Physics/Computing Sciences
- R. Poutissou (TWIST collaboration), *Using the WestGrid Glacier cluster to untangle TWIST*, Proc. **5th Annual BC-NET Advanced Networks Conf., Vancouver, BC, 2004**.
- G.C. Ball, *High resolution gamma-ray spectroscopy at TRIUMF-ISAC: the new frontier of radioactive ion beam research*, Proc. **Workshop on Production and Utilization of Radioactive Ion Beams from ISOL Type Facilities, Puri, India, February 16–19, 2004**.
- G.C. Ball, *High resolution gamma-ray spectroscopy at TRIUMF-ISAC: the new frontier of radioactive ion beam research*, Proc. **Seaborg Symp. in Honour of Don Fleming, National ACS Meeting, Anaheim, CA, March 30, 2004**.
- M.K. Craddock, *An analytic approach to FFAG optics*, Proc. **FFAG Workshop, TRIUMF, Vancouver, BC, April 15–21, 2004**.
- R.K. Carnegie, M.S. Dixit, H. Mes, E. Neuheimer, A. Rankin, K. Sachs and J.-P. Martin, *First tracking experience for MPGD TPC readout with charge dispersion on a resistive anode*, Proc. **Int. Linear Collider Workshop (LCWS 2004)**, Paris, France, April 19–23, 2004.
- D. Karlen, P. Poffenberger and G. Rosenbaum, *GEM-TPC performance in a magnetic field*, *ibid.*
- W.R. Rawnsley, Y. Bylinski, K. Fong, R.E. Laxdal, G. Dutto and D. Giove, *Alignment of the ISAC-II medium beta cryomodule with a wire monitoring system*, Proc. **20th Int. Cryogenic Engineering Conf., Beijing, China, May 11–14, 2004**.
- M.S. Dixit *et al.*, *Resolution of a MPGD readout TPC using the charge dispersion signal*, Proc. **Victoria Linear Collider Workshop (ALCPG2004)**, Victoria, BC, July 28–31, 2004.
- R.E. Laxdal, Y. Bylinskii, G.S. Clark, K. Fong, A.K. Mitra, R.L. Poirier, B. Rawnsley, T. Ries, I. Sekatchev, G. Stanford and V. Zvyagintsev, *Cold test results of the ISAC-II medium beta high gradient cryomodule*, Proc. **XXII Int. Linear Accelerator Conf. (LINAC 2004)**, Lübeck, Germany, August 16–24, 2004 (GSI, Germany, in press).
- R.L. Poirier, K. Fong, P. Harmer, R.E. Laxdal, A.K. Mitra, I. Sekatchev, B. Waraich and V. Zvyagintsev, *RF coupler design for the TRIUMF ISAC-II superconducting quarter wave resonator*, *ibid.*
- W. Rawnsley, Y. Bylinski, G. Dutto, K. Fong, R. Laxdal, T. Ries and D. Giove, *A wire position monitor system for the ISAC-II cryomodule components alignment*, *ibid.*
- P. Schmor, *Developments and future plans at ISAC/TRIUMF*, *ibid.*

K. Fong, S. Fang and M.P. Laverly, *Status of rf control system for ISAC-II superconducting cavities*, *ibid.*

R.E. Laxdal and Z.H. Peng, *High beta cavity optimization for ISAC-II*, *ibid.*

G. Stanford, Y. Bylinskii, R.E. Laxdal, B. Rawnsley, T. Ries and I. Sekatchev, *Engineering and cryogenic testing of the ISAC-II medium beta cryomodule*, *ibid.*

M. Dixit, *A review of tracking sessions*, Proc. **2nd Workshop of the ECFA Physics and Detectors for a Linear Collider**, Durham, UK, September 1–4, 2004.

M.S. Dixit *et al.*, *GEM-TPC resolution from charge dispersion*, *ibid.*

F. Ames, K. Jayamanna, D.H.L. Yuan, M. Olivo, R. Baartman, P. Bricault, M. McDonald, P. Schmor and T. Lamy, *Charge state breeding with an ECRIS for ISAC at TRIUMF*, Proc. **16th Int. Workshop on Electron Cyclotron Resonance Ion Sources (ECRIS'04)**, Berkeley, CA, September 26–30, 2004 (AIP, in press).

G.C. Ball, *High resolution gamma-ray spectroscopy at TRIUMF-ISAC: the new frontier of radioactive ion beam research*, Proc. **18th Int. Conf. on the Application of Accelerators in Research and Industry**, Fort Worth, TX, October 10–15, 2004.

M.S. Dixit *et al.*, *MPGD-TPC resolution from charge dispersion on a resistive anode*, Proc. **IEEE Nuclear Science Symp.**, Rome, October 16–24, 2004.

D.M. Gingrich *et al.* (STACEE collaboration), *The STACEE ground-based gamma-ray detector*, *ibid.* [astro-ph/0506613].

R. Baartman and S. Martin, *Summary of session H: FFAGs and cyclotrons*, Proc. **33rd ICFA Advanced Beam Dynamics Workshop: High Intensity High Brightness Hadron Beams (ICFA HB2004)**, Bensheim, Darmstadt, Germany, October 18–22, 2004 (AIP Conf. Proc., in press).

G. Dutto, *TRIUMF high intensity cyclotron development for ISAC*, Proc. **17th Int. Conf. on Cyclotrons and Their Applications**, Tokyo, Japan, October 18–22, 2004 (in press) [TRI-PP-04-28].

S. Koscielniak, *Novel constant-frequency acceleration technique for non-scaling muon FFAGs*, *ibid.* [TRI-PP-04-29].

I. Bylinski, *TRIUMF cyclotron rf system refurbishing*, *ibid.* [TRI-PP-04-30].

A. Mitra *et al.*, *Simulation of rf structure of TRIUMF cyclotron with HFSS*, *ibid.* [TRI-PP-04-31].

P. Schmor, *TRIUMF ISAC-II and beyond*, *ibid.* [TRI-PP-04-32].

M.K. Craddock, *Cyclotrons and FFAGs in 2004*, *ibid.* [TRI-PP-04-33].

Molecular and Materials Science

J.E. Sonier, *Interplay of magnetism and superconductivity in electron-doped cuprates*, Proc. **American Physical Society March Meeting**, March 20–26, 2004, Montreal, PQ.

I. McKenzie, P.W. Percival and J.A.C. Clyburne, *A computational study of the reactions of a beta-diketiminatoaluminium(I) complex with the hydrogen atom and the electron*, Proc. **American Chemical Society National Meeting**, Anaheim, CA, March 28–30, 2004 (Chem. Comm., in press).

I. McKenzie, *Organic free radicals probed by muonium*, *ibid.*

P.W. Percival, *Pressure-cooker chemistry: probing chemical reactions in high temperature water with muons*, Proc. **Canada-US Joint Workshop on Innovative Chemistry in Clean Media**, Montreal, PQ, May 20–21, 2004.

J. Sugiyama, J.H. Brewer, E.J. Ansaldo, J.A. Chakhalian, H. Nozaki, H. Hazama, R. Asahi, T. Tani, Y. Ono and T. Kajitani, *Spin state transition in Ca-doped $\text{Na}_{0.7}\text{CoO}_2$: muon spin rotation and relaxation in the layered cobaltites with the nominal Co valence below 3.16*, Proc. **Int. Conf. on Thermoelectrics**, Adelaide, Australia, July 25–29, 2004 (IEEE, Piscataway, in press).

J. Sugiyama, J.H. Brewer, E.J. Ansaldo, B. Hitti, M. Mikami, Y. Mori and T. Sasaki, *Electron correlation in the two-dimensional triangular lattice of Na_xCoO_2 with $x \geq 0.6$* , Proc. **Int. Conf. on Strongly Correlated Electron Systems**, Karlsruhe, Germany, July 26–30, 2004 (Physica B, in press).

R.F. Kiefl, K.H. Chow, S. Daviel, W. Dong, M. Hossain, T. Keeler, S.R. Kreitzman, C.D.P. Levy, W.A. MacFarlane, G.D. Morris, T. Parolin, R. Poutissou and Z. Salman, *Beta-detected NMR and NQR using low energy beams of polarized radioactive nuclei: a novel probe of thin films and interfaces*, Proc. **12th Int. Conf. on Hyperfine Interactions**, Bonn, Germany, August 23–27, 2004 (Hyp. Int., in press).

J. Sugiyama, H. Nozaki, H. Itahara, T. Tani, J.H. Brewer, E.J. Ansaldo, J.A. Chakhalian and H. Hazama, *μSR studies on thermoelectric cobalt oxides VI: muonic Knight shift*, Proc. **Physical Society Japan Autumn Meeting**, Aomori, Japan, 2004 (Meeting Abstracts Phys. Soc. Jpn., in press).

H. Nozaki, J. Sugiyama, J.H. Brewer, E.J. Ansaldo, T. Takami, H. Ikuta and H. Hazama, *μSR studies on thermoelectric cobalt oxides VII: one-dimensional system*, *ibid.*

P.W. Percival, *Hydrogen atom chemistry studied via its isotope muonium*, Proc. **5th Int. Conf. on Low Temperature Chemistry**, Berlin, September 7–10, 2004.

J. Sugiyama, D. Andreica, H. Itahara and T. Tani, *Magnetism of layered cobaltites under hydrostatic pressure as probed by $\mu^+\text{SR}$; $[\text{Ca}_2\text{CoO}_3]_{0.62}[\text{CoO}_2]$ and $[\text{Ca}_2\text{Co}_{4/3}\text{Cu}_{2/3}\text{O}_4]_{0.62}[\text{CoO}_2]$* , Proc. **1st Workshop on Anisotropic Science and Technology of Materials and**

Devices, Osaka, October 31–November 1, 2004 (TIC, Kyoto, in press).

Life Sciences

D.T. Yapp, T.J. Ruth, M.J. Adam, C.J. Koch, M.E. Gleeve and K.A. Skov, *Non-invasive evaluation of tumour hypoxia with ^{18}F -EF5 and microPET in androgen dependent murine model for prostate cancer*, Proc. **95th American Association for Cancer Research, Orlando, FL, March 26–31, 2004**.

C.L. Fisher, B.O. Patrick, M.J. Adam and C. Orvig, *Cyclopentadienyltricarbonyl rhenium (I) and technetium (I) complexes containing pendant glucose derivatives: potential radiopharmaceuticals for imaging and therapy*, Proc. **Int. Conf. Organometallic Chemistry, Vancouver, BC, July 2004**.

C. Ewart, S.R. Bayly, M.J. Adam and C. Orvig, *PADA-glucosamide-complexation of a new tridentate ligand based on glucosamine to the $[M(\text{CO})_3]^+$ core ($M = \text{Tc}, \text{Re}$)*, *ibid.*

V. Sossi, J.E. Holden, T.J. Ruth, A.J. Stoessl and D. Doudet, *Strategies to reduce scanning time in receptor imaging with positron emission tomography*, Proc. **5th Int. Conf. on Neuroreceptor Mapping, Vancouver, BC, July 15–18, 2004**.

C.L. Fisher, D.E. Green, T. Storr, S.R. Bayly, S. Lapi, M.J. Adam and C. Orvig, *Radiometal complexes with pendant glucose derivatives for molecular imaging and radiotherapy*, Proc. **228th American Chemical Society Meeting, Philadelphia, PA, August 22–26, 2004**.

M.N. Fedoruk, H. Dougan, C.M. Ludgate and C.C. Nelson, *Auger therapy for prostate cancer*, Proc. **5th Int. Symp. on Radiohalogens, Whistler, BC, September 15, 2004**.

A. Rahmim, T.J. Ruth, and V. Sossi, *Study of a convergent subsetized list-mode EM reconstruction algorithm*, Proc. **IEEE/MIC, Rome, Italy, October 16–24, 2004**.

M-L. Camborde, A. Rahmim, D.F. Newport, S. Siegel, K.R. Buckley, E. Vandervoort, T.J. Ruth and V. Sossi, *Effect of normalization method on image uniformity and distribution volume ratio estimates on microPET[®] R4*, *ibid.*

V. Sossi, M-L. Camborde, D. Newport, A. Rahmim, G. Tropini, D. Doudet and T.J. Ruth, *The influence of measurement uncertainties on the evaluation of the distribution volume ratio in rat studies on a microPET[®] R4: a phantom study*, *ibid.*

Theoretical Program

A. Czarnecki, *Theoretical summary of Moriond 2004: QCD and hadronic interactions*, Proc. **39th Rencontres de Moriond on QCD and High-Energy Hadronic Interactions, La Thuile, Italy, March 28–April 4, 2004** [TRI-PP-04-11, Alberta-thy-1604, hep-ph/0407251].

C. Barbieri and L. Lapikás, *Two-step rescattering in $(e, e'p)$ reactions*, Proc. **VIII Conf. on Electron-Nucleus Scattering, Isola d'Elba, Italy, June 21–25, 2004** (Eur. Phys. J., in press) [TRI-PP-04-18].

K.Y. Wong and R.M. Woloshyn, *Topology and staggered fermion action improvement*, Proc. **22nd Int. Symp. on Lattice Field Theory (Lattice 2004), Batavia, IL, June 21–26, 2004** (Elsevier, in press) [hep-lat/0407003].

C. Barbieri and B.K. Jennings, *Study of the $^{16}\text{O}(p, \gamma)$ reaction at astrophysical energies*, Proc. **8th Symp. on Nuclei in the Cosmos (NICVIII), Vancouver, BC, July 19–23, 2004** (Nucl. Phys. A, in press) [TRI-PP-04-34, nucl-th/0408017].

R.H. Cyburt, *What's next for big bang nucleosynthesis?*, *ibid.* [TRI-PP-04-36].

R.H. Cyburt, *Creating nuclear data representations and error budget accounting*, *ibid.* [TRI-PP-04-37].

R.H. Cyburt, *The $^7\text{Be}(p, \gamma)^8\text{B}$ reaction and its future*, *ibid.* [TRI-PP-04-38].

J.-M. Sparenberg, *Hybrid potential/R-matrix models for the $^{12}\text{C} + \alpha$ system*, *ibid.* [TRI-PP-04-41].

E. Tikhomolov, *Large-scale vortical flows and penetrative convection in the sun*, *ibid.* [TRI-PP-04-42].

Y. Fujiwara, K. Miyagawa, M. Kohno, Y. Suzuki, D. Baye and J.-M. Sparenberg, *Faddeev calculations of light Λ hypernuclei based on the SU_6 quark model baryon-baryon interactions*, Proc. **Int. Workshop on Strangeness Nuclear Physics, Osaka University, Japan, July 29–31, 2004** (World Scientific, in press).

W. Liao, *Toward precision measurements in solar neutrinos*, Proc. **32nd Int. Conf. on High-Energy Physics (ICHEP 04), Beijing, China, August 16–22, 2004** (World Scientific, Hackensack, NJ, in press).

M.C.B. Fernanades, A.E. Santana, J.D.M. Vianna and F.C. Khanna, *Unitary representations of the Poicare group in a symplectic manifold*, Proc. **XXV Brazilian National Meeting on Particles and Fields, Sao Paulo, Brazil, September, 2004**.

A.P.C. Malbouisson, H. Queiroz, J.C. de Silva, J.M.C. Malbouisson, F.C. Khanna and A.E. Santana, *Spontaneous symmetry breaking in the 3-dimensional Gross-Neveu model at finite temperature*, *ibid.*

B.R. Barrett, P. Navratil, A. Nogga, W.E. Ormand, I. Stetcu, J.P. Vary and H. Zhan, *Ab initio large-basis no-core shell model*, Proc. **Int. Conf. on Nuclear Data for Science and Technology 2004 (ND2004), Santa Fe, NM, September 26–October 1, 2004** (AIP, in press).

H.G. Miller, A.R. Plastino, A. Plastino, A.R. Ritchie and F.C. Khanna, *Pairing phase transitions in nuclear physics*, Proc. **28th Int. Workshop on Condensed Matter Theo-**

ries, Washington Univ., St. Louis, MO, September 27–October 2, 2004.

C. Barbieri and W.H. Dickhoff, *Self-consistent Green's function calculation of ^{16}O at small missing energies*, Proc. **Workshop on Nuclear Forces and Many-Body Problems, Seattle, WA, October 4–8, 2004** (J. Phys. G, in press) [TRI-PP-04-24, nucl-th/0410082].

F.C. Khanna, J.M.C. Malbouisson and A.E. Santana, *Thermofield dynamics: generalised Bogoliubov transformations and Casimir effect*, Proc. **NATO-ARW, Tashkent, Uzbekistan, October 10–16, 2004**.

A.E. Santana, A.P.C. Malbouisson, J.M.C. Malbouisson and F.C. Khanna, *Thermofield dynamics and confined systems: applications to physical systems*, *ibid.*

L. Theussl, S. Noguera and V. Vento, *Generalized parton distributions of the pion in a Bethe-Salpeter approach*, Proc. **Int. Conf. on the Structure of Baryons, Palaiseau, France, October 25–29, 2004** (Nucl. Phys. A, in press).

Technology Transfer

P.L. Gardner, A.Y. Fong and L. Graham, *From innovation to enterprise – the role of technology commercialization in sustaining economic development and growth*, Proc. **Int. Engineering Management Conf. 2004 (IEMC 2004), Singapore, October 18–21, 2004**.

A.Y. Fong and P.L. Gardner, *The role of basic research in economic development*, Proc. **4th Int. Symp. on Management of Technology (ISMOT'04), Hangzhou, China, October 24–26, 2004**.

P.L. Gardner and A.Y. Fong, *An analysis of international achievements in technology commercialization*, *ibid.*

Books

J.E. Holden and D.J. Doudet, *PET receptor assay with multiple ligand concentrations: an equilibrium approach* in *Methods in Enzymology: Imaging*, ed. M. Conn (Academic Press, in press).

Theses

L.A. Courneyea, *Photoionization of the $5P_{1/2}$ state of cooled and trapped potassium atoms* (B.Sc., Physics, University of British Columbia).

A. Bebington, *Investigating the $^{13}\text{C}(p, \gamma)^{14}\text{N}$ reaction and using GEANT to test the DRAGON's acceptance* (M.Sc., Physics, University of Surrey, UK).

E.S. Cunningham, *The development of SCEPTAR, the new scintillator array for the 8π spectrometer and its use in the study of the ^{32}Na decay* (M.Sc., Physics, University of Surrey, UK).

D. Gigliotti, *Efficiency calibration measurement and GEANT simulation of the DRAGON BGO gamma array at TRIUMF* (M.Sc., Physics, University of Northern British Columbia).

G.F. Grinyer, *High precision measurements of ^{26}Na β^- decay* (M.Sc., Physics, University of Guelph).

S. Kecman, *Muonium kinetics and free radical formations in solutions of fullerenes* (M.Sc., Chemistry, Simon Fraser University).

M. Lamey, *A microchannel detection system for DRAGON* (M.Sc., Physics, Simon Fraser University).

J.G. Publicover, *Energy mapping of scattered protons within a gas target* (M.Sc., Physics and Astronomy, University of Victoria).

M. Gericke, *The NPDGamma experiment – the weak interaction between nucleons and parity violation in cold neutron capture* (Ph.D., Physics, Indiana University).

H. Itahara, *Processing design, synthesis and thermoelectric properties of textured cobaltite ceramics* (Ph.D., Engineering, Nagoya University).

I. McKenzie, *Investigations of the structure and dynamics of novel muoniated radicals* (Ph.D., Chemistry, Simon Fraser University).