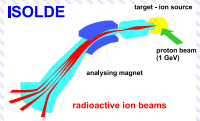
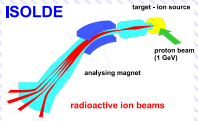


ISOLDE at the turn of the millennium*

Juha Äystö
Helsinki Institute of Physics
Helsinki, Finland

* As seen by the ISOLDE Physics Group

50 years of CERN - 40 years of ISOLDE
my contribution as a chair of INTC



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Physics Reports 403–404 (2004) 459–469

PHYSICS REPORTS

www.elsevier.com/locate/physrep

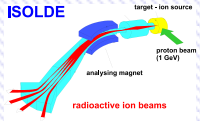
CERN's longest serving experimental facility

Juha Äystö[a, b, *, 1]

[a] *Department of Physics, University of Jyväskylä, Jyväskylä, Finland*
[b] *Helsinki Institute of Physics, University of Helsinki, Helsinki, Finland*

editor: R. Petronzio

for the ISOLDE Collaboration



PS-ISOLDE Group

M. Lindroos, Coordinator

ISOLDE Collaboration

P. Van Duppen
(chairman)

MoU

May, 2000

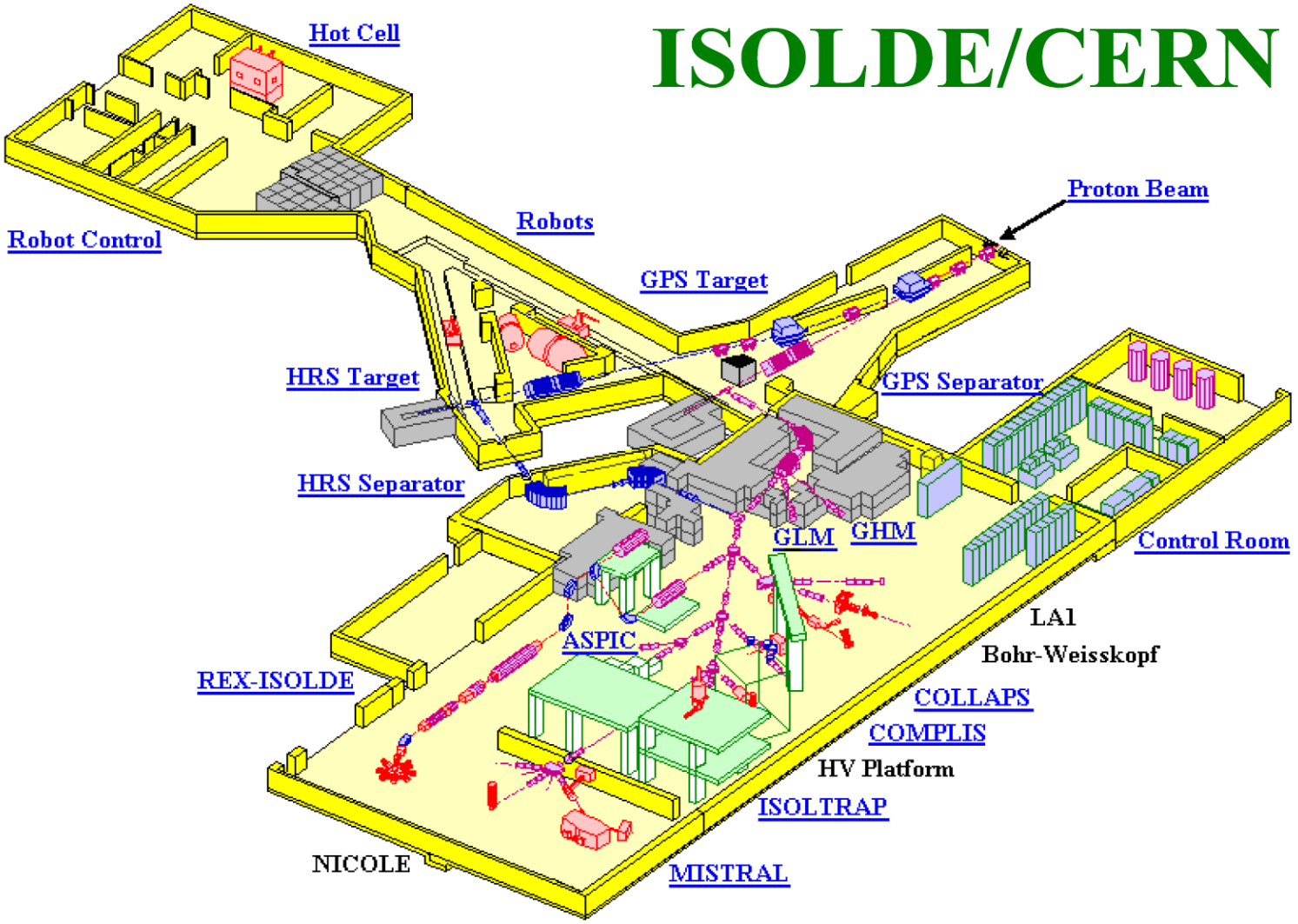
ISOLDE Physics Group

J. Äystö, Group Leader
T. Nilsson, Physics Coordinator
H. Ravn, CERN staff scientist
Fellows etc. :
U. Koester
M. Oinonen
L. Weissmann
F. Herfurth
ISOLTRAP team
REX-ISOLDE team
…..

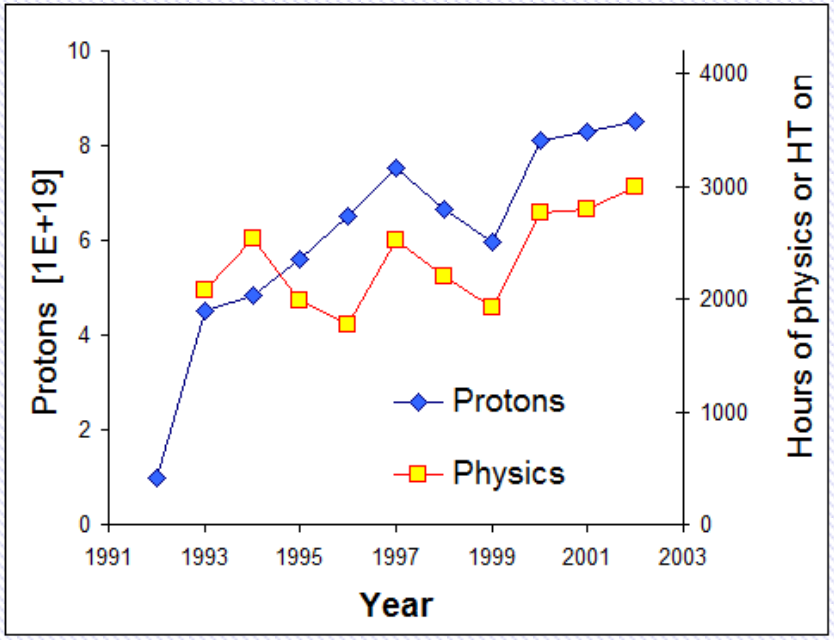
ISOLDE Scientific Committee

H. Flocard, Orsay
(chairman)

Layout 2002


ISOLDE/CERN
Hot Cell
Robot Control
Robots
Proton Beam
GPS Target
HRS Target
GPS Separator
HRS Separator
GLM
GHM
Control Room
LA1
Bohr-Weisskopf
ASPIC
REX-ISOLDE
COLLAPS
COMPLIS
HV Platform
ISOLTRAP
NICOLE
MISTRAL
http://www.cern.ch/ISOLDE

ISOLDE 2002 Annual Report



2002: Push-Pull mode of operations of HRS and GPS!

The ISOLDE target manipulation robots. In the far background the GPS and HRS front-ends can been glimpsed.

European initiatives on ion trapping
ISOLTRAP - REXTRAP

1998-2001

2002 - …

EXO TRAPS

EUROTRAPS

ISOL TRAP

NIPNET

ION CATCHER

Cooling and bunching of low-energy RIBs

Nucl. Instr. Meth. A469, Issue 2

A linear radiofrequency ion trap for accumulation, bunching, and emittance improvement of radioactive ion beams

F. Herfurth[a,*], J. Dilling[a], A. Kellerbauer[a,b], G. Bollen[c], S. Henry[d], H.-J. Kluge[a], E. Lamour[a], D. Lunney[d], R.B. Moore[e], C. Scheidenberger[a], S. Schwarz[a,b], G. Sikler[a], J. Szerypo[f]

ISOLTRAP

Beam cooler for low-energy radioactive ions

A. Nieminen[a,*], J. Huikari[a], A. Jokinen[a], J. Äystö[a,1], P. Campbell[b], E.C.A. Cochrane[c,2]

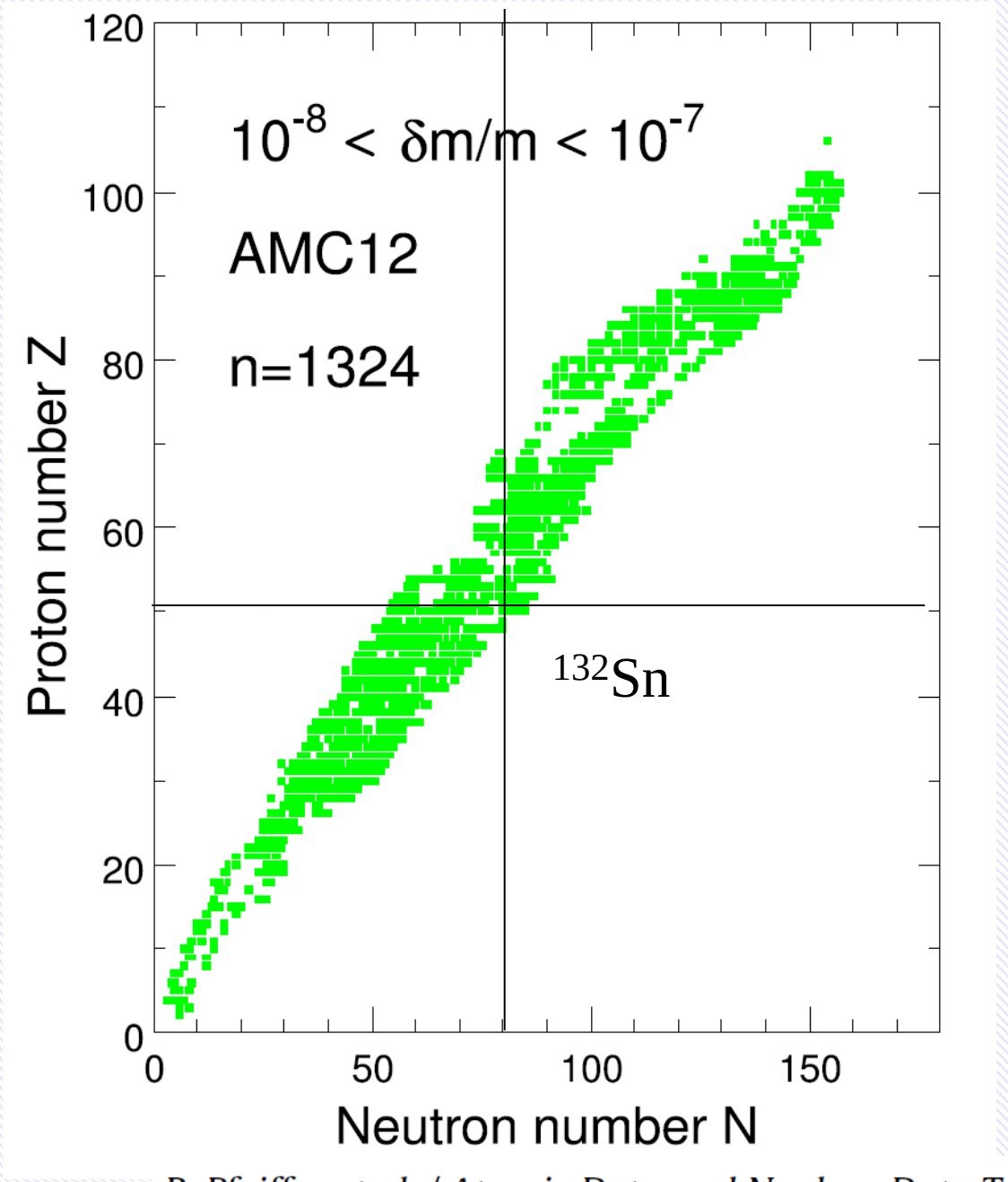
JYFLTRAP

Buffer gas cooling of ion beams

A. Kellerbauer*, T. Kim, R.B. Moore, P. Varfalvy

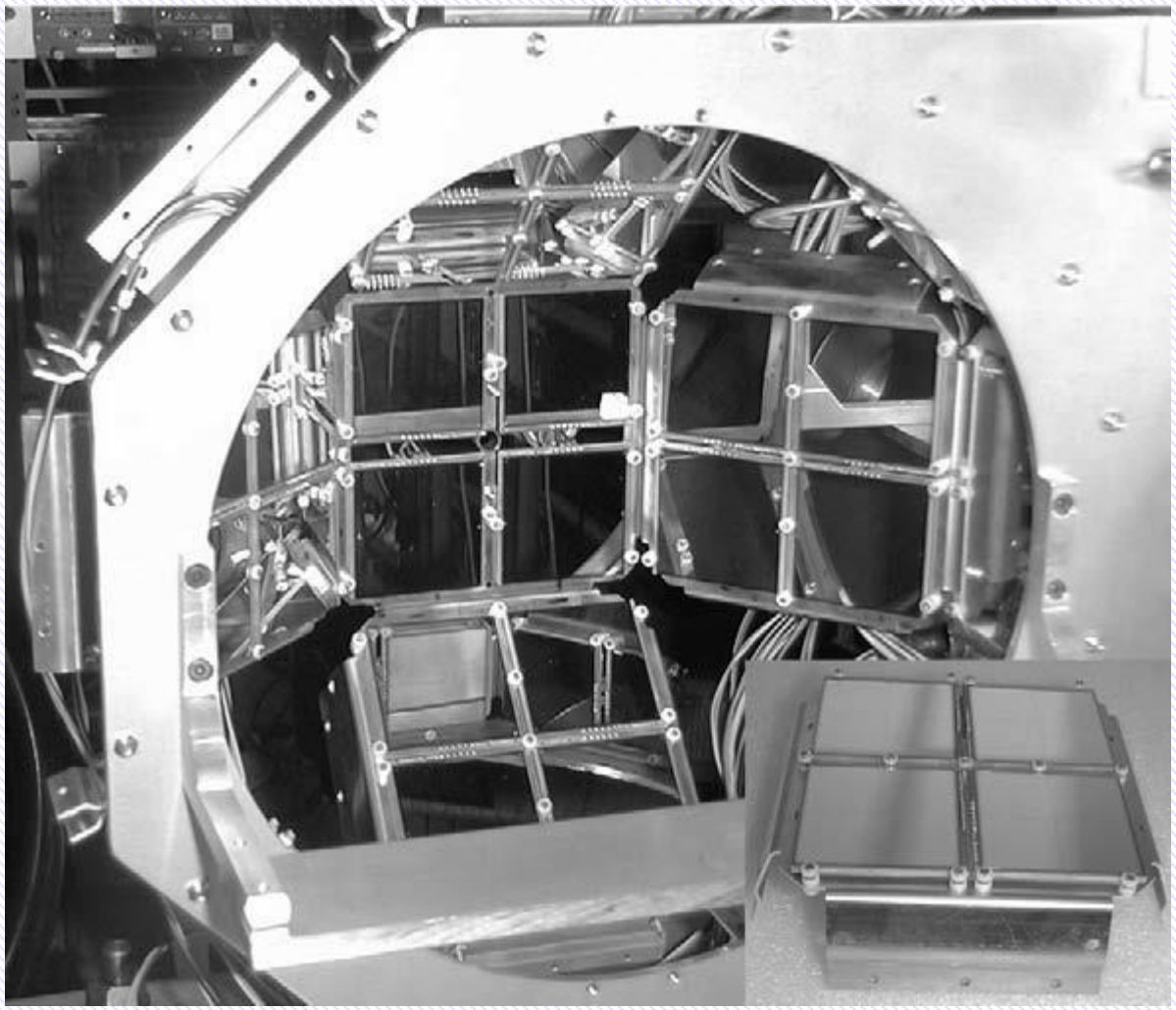
McGill at Montreal

Huge impact on:
- sensitivity in collinear laser spectrocopy (x 10^5)
- optical pumping applications
- fast/efficient injection into Penning traps



B. Pfeiffer et al. / Atomic Data and Nuclear Data Tables 100 (2014) 403

The ISOLDE Silicon Ball

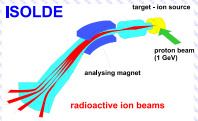


L.M. Fraile & J. Aysto,
Nucl. Instr. Meth. A 513 (2003) 287–290

PHYSICAL REVIEW C, VOLUME 63, 044316

Spectroscopy of ^{34,35}Si by β decay: *sd-fp* shell gap and single-particle states

S. Nummela,[1,2] P. Baumann,[3] E. Caurier,[3] P. Dessagne,[3] A. Jokinen,[1,2] A. Knipper,[3] G. Le Scornet,[4,5] C. Miehé,[3] F. Nowacki,[6] M. Oinonen,[5] Z. Radivojevic,[1] M. Ramdhane,[7] G. Walter,[3] J. Äystö,[1,5] and the ISOLDE Collaboration



PHYSICAL REVIEW C, VOLUME 64, 054313

Intruder features in the island of inversion: The case of ^{33}Mg

S. Nummela,[1] F. Nowacki,[2] P. Baumann,[3] E. Caurier,[3] J. Cederkäll,[4] S. Courtin,[3] P. Dessagne,[3] A. Jokinen,[1,5] A. Knipper,[3] G. Le Scornet,[4,6] L. G. Lyapin,[7] Ch. Miehé,[3] M. Oinonen,[4] E. Poirier,[3] Z. Radivojevic,[1] M. Ramdhane,[8] W. H. Trzaska,[1,5] G. Walter,[3] J. Äystö,[1,4] and the ISOLDE Collaboration

VOLUME 87, NUMBER 14 PHYSICAL REVIEW LETTERS 1 OCTOBER 2001

Breakdown of the Isobaric Multiplet Mass Equation at $A = 33, T = 3/2$

F. Herfurth,[1,3,*] J. Dilling,[1] A. Kellerbauer,[2,5] G. Audi,[4] D. Beck,[6,1] G. Bollen,[3,8] H.-J. Kluge,[1] D. Lunney,[4] R. B. Moore,[5] C. Scheidenberger,[1] S. Schwarz,[2,8] G. Sikler,[1] J. Szerypo,[7] and ISOLDE Collaboration[2]

ELSEVIER
Nuclear Physics A 677 (2000) 38–60
NUCLEAR PHYSICS A
www.elsevier.nl/locate/npe

The β2p decay mechanism of ^{31}Ar

H.O.U. Fynbo [a,1], M.J.G. Borge [b], L. Axelsson [c], J. Äystö [d,1], U.C. Bergmann [a], L.M. Fraile [b], A. Honkanen [d,2], P. Hornshøj [a], Y. Jading [e], A. Jokinen [d], B. Jonson [c], I. Martel [e,3], I. Mukha [a,4], T. Nilsson [c,1], G. Nyman [c], M. Oinonen [d,1], I. Piqueras [b], K. Riisager [a], T. Siiskonen [d], M.H. Smedberg [c], O. Tengblad [b], J. Thaysen [a], F. Wenander [c], ISOLDE Collaboration [e]

VOLUME 91, NUMBER 16 PHYSICAL REVIEW LETTERS week ending 17 OCTOBER 2003

$N = 82$ Shell Quenching of the Classical *r*-Process "Waiting-Point" Nucleus ^{130}Cd

I. Dillmann,[1,2] K.-L. Kratz,[1,*] A. Wöhr,[3,4] O. Arndt,[1] B. A. Brown,[5] P. Hoff,[6] M. Hjorth-Jensen,[7] U. Köster,[8] A. N. Ostrowski,[1] B. Pfeiffer,[1] D. Seweryniak,[9] J. Shergur,[3,9] W. B. Walters,[3] and the ISOLDE Collaboration[8]

PHYSICAL REVIEW C, VOLUME 65, 034313

β-decay studies of $^{135-137}$Sn using selective resonance laser ionization techniques

J. Shergur,[1] B. A. Brown,[2] V. Fedoseyev,[3] U. Köster,[4] K.-L. Kratz,[5] D. Seweryniak,[1,6] W. B. Walters,[1] A. Wöhr,[1]

Hyperfine Interactions 127 (2000) 409–416 409

The ISOLDE laser ion source for exotic nuclei

V.N. Fedoseyev [a,*], G. Huber [b], U. Köster [c], J. Lettry [c], V.I. Mishin [a], H. Ravn [c], V. Sebastian [b] and the ISOLDE Collaboration [c]

Eur. Phys. J. A 8, 31–40 (2000)

THE EUROPEAN PHYSICAL JOURNAL A

Measurement of the electric quadrupole moments of $^{26-29}$Na

M. Keim[1], U. Georg[2], A. Klein[2], R. Neugart[2], M. Neuroth[2], S. Wilbert[2], P. Lievens[3], L. Vermeeren[4], B.A. Brown[5], and the ISOLDE Collaboration[1]

PHYSICAL REVIEW C, VOLUME 65, 024315

Magnetic moments of $^{68}Cu^{g,m}$ and $^{70}Cu^{g,m_1,m_2}$ nuclei measured by in-source laser spectroscopy

L. Weissman,* U. Köster, R. Catherall, S. Franchoo, U. Georg, and O. Jonsson
ISOLDE, CERN, 1211 Genève 23, Switzerland

JOURNAL OF APPLIED PHYSICS VOLUME 88, NUMBER 3

Emission channeling studies of Pr in GaN

U. Wahl,[a)] A. Vantomme, and G. Langouche
Instituut voor Kern- en Stralingsfysica, University of Leuven, Celestijnenlaan 200 D, B-3001 Leuven, Belgium

J.P. Araújo
Instituto de Física dos Materiais da Universidade do Porto, P-4150 Porto, Portugal

L. Peralta
Laboratório de Instrumentação e Física Experimental de Partículas, Faculdade de Ciencias da Universidade de Lisboa, Avenida Elias Garcia 14-1, P-1000-149 Lisbon, Portugal

J. G. Correia and the ISOLDE Collaboration
CERN-EP, CH-1211 Geneva 23, Switzerland

VOLUME 84, NUMBER 7 PHYSICAL REVIEW LETTERS 14 FEBRUARY 2000

Lattice Location and Stability of Ion Implanted Cu in Si

U. Wahl,* A. Vantomme, and G. Langouche
Instituut voor Kern- en Stralingsfysica, University of Leuven, Celestijnenlaan 200 D, B-3001 Leuven, Belgium

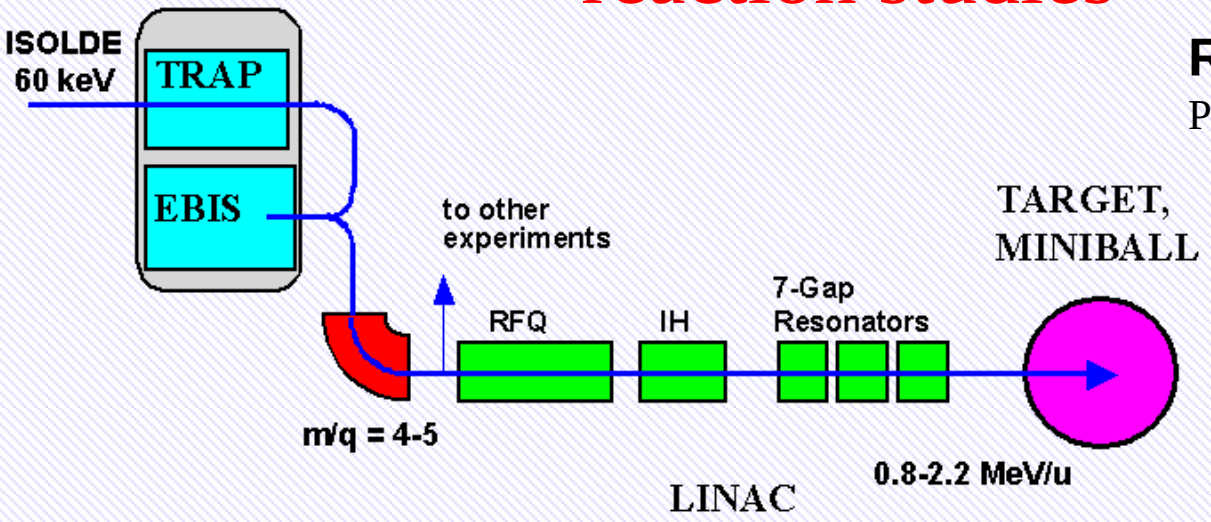
J. G. Correia and ISOLDE Collaboration
CERN-EP, CH-1211 Geneva 23, Switzerland

VOLUME 89, NUMBER 8 PHYSICAL REVIEW LETTERS 19 AUGUST 2002

Self-Diffusion of ^{31}Si and ^{71}Ge in Relaxed $Si_{0.20}Ge_{0.80}$ Layers

P. Laitinen,[1] A. Strohm,[2,3] J. Huikari,[1] A. Nieminen,[1] T. Voss,[2] C. Grodon,[3] I. Riihimäki,[1] M. Kummer,[4] J. Äystö,[1] P. Dendooven,[1] J. Räisänen,[1] W. Frank,[2,3] and the ISOLDE Collaboration*

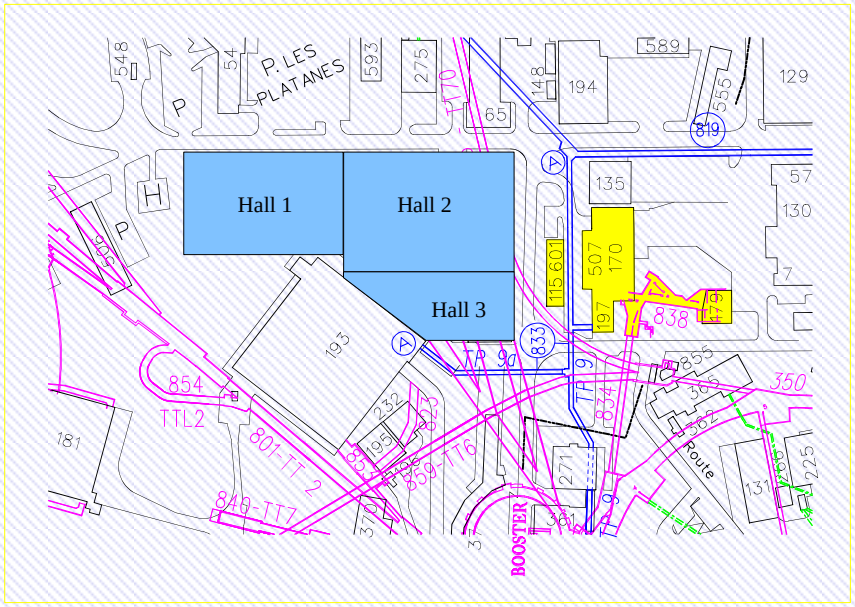
Radioactive beams for nuclear reaction studies



REX-ISOLDE

Post-accelerated ions for

1. Nuclear structure studies
2. Nuclear astrophysics



Next Generation RNB-facility

SPL, antiprotons, muons, ISOLDE

EURISOL

EU-FP5 RTD Feasibility Study

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ELSEVIER
Nuclear Instruments and Methods in Physics Research B 204 (2003) 20–30
NIM B
Beam Interactions with Materials & Atoms
www.elsevier.com/locate/nimb

Accelerated radioactive beams from REX-ISOLDE

O. Kester [*,1], T. Sieber [a], S. Emhofer [a], F. Ames [a], K. Reisinger [a], P. Reiter [a], P.G. Thirolf [a], R. Lutter [a], D. Habs [a], B.H. Wolf [b], G. Huber [b], P. Schmidt [b], A. N. Ostrowski [b], R. von Hahn [c], R. Repnow [c], J. Fitting [c], M. Lauer [c], d, e, non [i], k

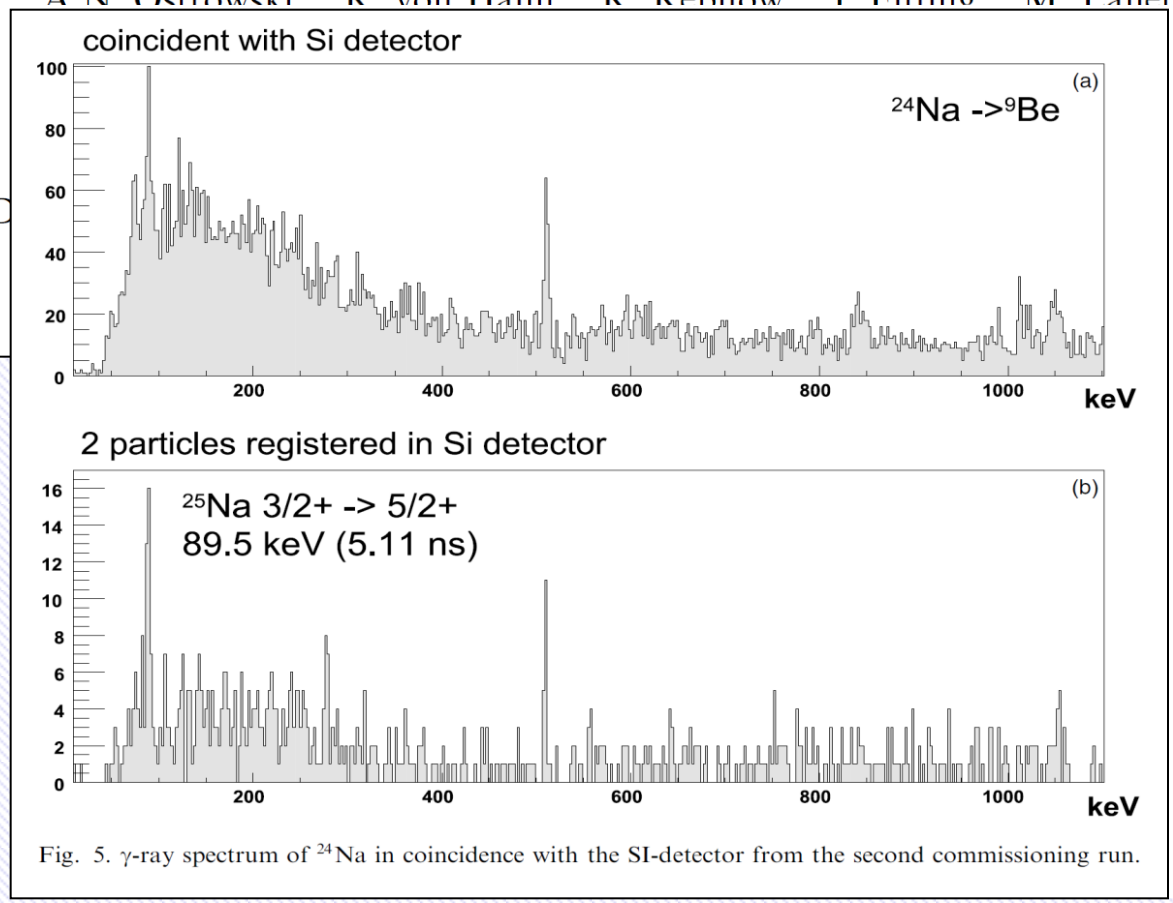
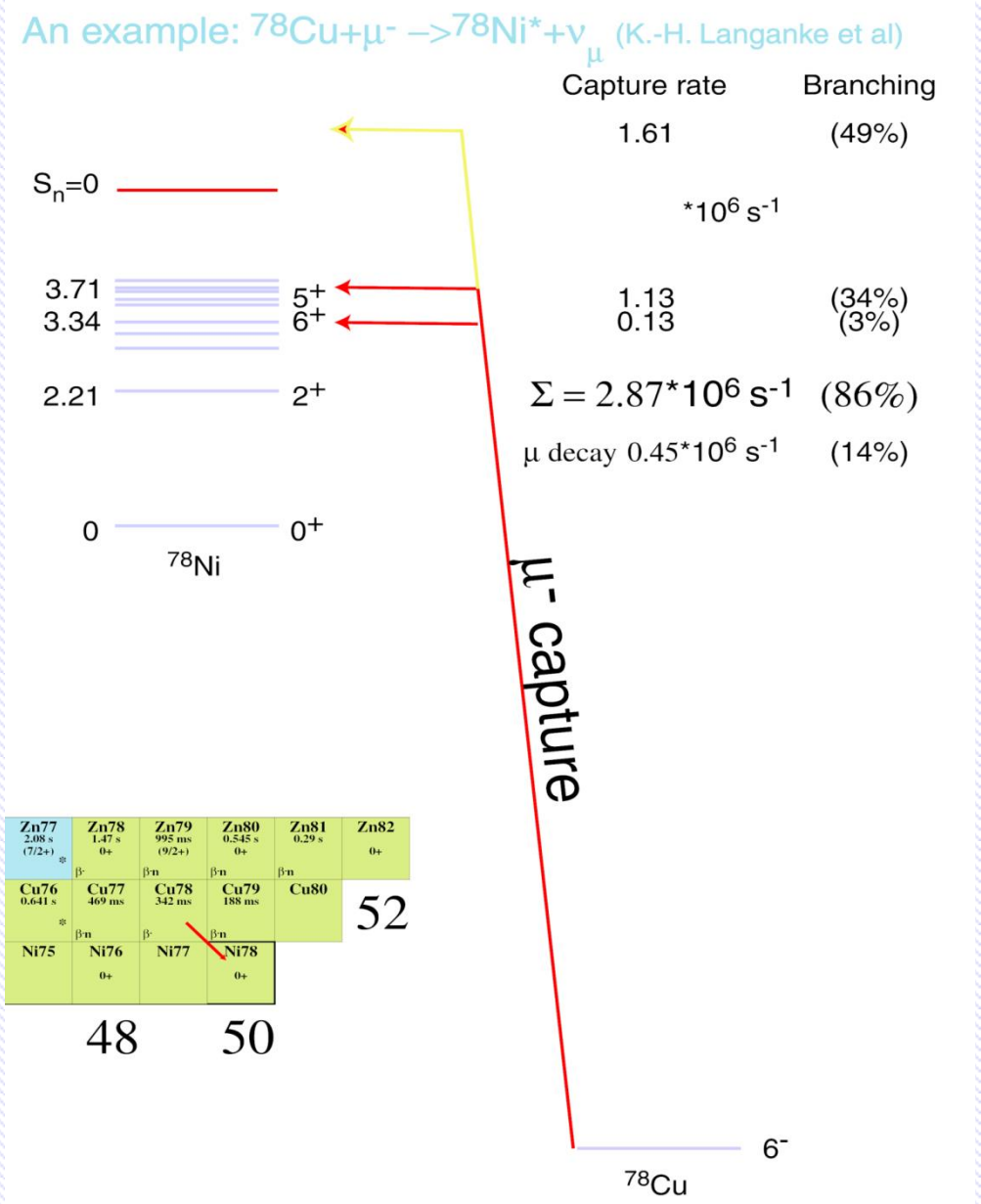


Fig. 5. γ-ray spectrum of ^{24}Na in coincidence with the SI-detector from the second commissioning run.

”November 2001”



Not finished works:

Exotic probes !!!

Nuclear processes with atomic x sections!

ECT* RAMA workshop
May 2001

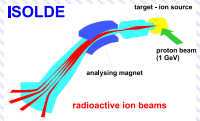
RAMA = Radioactive Antiprotonic and Muonic Atoms

T. Nilsson, J. Aysto, K. Langanke, K. Riisager, G. Martinez-Pinedod and E. Kolbee

Nuclear Physics A 746 (2004) 513c–517c

From my notebook:

October 17, 2001 DG, Maiani meets with "EP-senior staff" on the budget crisis!



Perspectives

Performance

≥ 400 shifts/year are possible, if resources are available and manpower installed
ISOLDE can maintain and extend its leading role (RNB 2000)

REX-ISOLDE

Enlarged user community including European in-beam γ-ray community
REX experiment ⇒ REX facility

within CERN

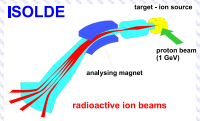
ISOLDE beams: High purity detector calibration sources (83-Kr)
ISOLDE expertise and laboratories: development of future high intensity targets (μ-collider, ν sources)

RNBs worldwide context

Despite worldwide efforts ISOLDE still leading
Collaboration with other ISOL facilities

CERN- ***an option for a European second generation facility ?***

SPC visits ISOLDE 2005



Happy Birthday !!

ISOLDE

You will have a bright future !!!