

PARTICLES

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GROUP

A **Newsletter** for those
interested in proton, light ion and
heavy charged particle radiotherapy.

Number 36

July 2005

Janet Sisterson Ph.D., NPTC

Costs: At PTCOG XIX, the Steering Committee decided that part of the registration fee for PTCOG meetings would be used to help produce both Particles and the abstracts of the PTCOG meetings. Only part of the costs is covered in this way, so more financial help is needed from the community. PTCOG is always happy to receive financial gifts; all such gifts are deductible as charitable contributions for federal income tax purposes. To learn how to do this, please contact Allan Thornton, the PTCOG secretary.

Facility and Patient Statistics: I continue to collect information about all operating or proposed facilities. Please send me your information. My latest [published](#) summary of the worldwide detailed patient statistics through 2001 is: "Status of Ion beam therapy in 2002." Author: J. M. Sisterson. In: Application of Accelerators in Research and Industry: 17th Int'l Conference, edited by J. L. Duggan and I. L. Morgan, 2003, CP680, American Institute of Physics. Copies are available on request.

This summary was updated through 2003 and presented at the 18th International Conference on the Applications of Accelerators in Research and Industry, October 10-15 2004. In 2005 it will be published as part of the proceedings and the reference will be of the form: J. M. Sisterson "Ion beam therapy in 2004", Nucl Instr. Meth. Bxxx (2005) yyy.

Please join!!!! PTCOG Mail server: Niek Schreuder and colleagues at the Midwest Proton Radiotherapy Institute in Bloomington, Indiana have initiated this new service. Here is how to join:

You can email Niek Schreuder at aschreud@indiana.edu and ask to be added to the mail server referred to as the PTCOG_List. This they can do without having to join Yahoo. Better, however, is to join yahoo by getting a yahoo account and login - free of charge - and then join the PTCOG_list group – see instructions below. This will allow them to see previous mail communications and other advantages.

Here is a sample set of instructions.

"If you would like to learn more about the PTCOG_List group or join the group, please visit http://groups.yahoo.com/group/PTCOG_List. To send a message to all the members (after you have joined) simply send email to PTCOG_List@yahoogroups.com". Only members can post messages to the group. A member is defined as someone who's email address is in the yahoo PTCOG_List. To unsubscribe from this group, send an email to: PTCOG_List-unsubscribe@yahoogroups.com.

Particles on the Internet The web page for PTCOG and the Particles Newsletter is: <http://ptcog.web.psi.ch>.

Other proton therapy links:

NPTC, MGH, Boston, MA, USA: <http://www.massgeneral.org/cancer/about/providers/radiation/proton/index.asp>

LLUMC, CA, USA: <http://www.llu.edu/proton>

U of California, Davis, CA, USA: <http://crocker.ucdavis.edu/cnl/research/eyet.htm>

Midwest Proton Radiotherapy Institute, IN, USA: <http://www.mpri.org>

M. D. Anderson, Houston, TX, USA: http://www.mdanderson.org/featured_sites/protontherapy
National Association for Proton Therapy: <http://www.proton-therapy.org>
TRIUMF, Canada; protons: http://www.triumf.ca/welcome/proton_thrpy.html
TRIUMF, Canada; pions: http://www.triumf.ca/welcome/pion_trtmt.html
CPO, Orsay, France: <http://www.protontherapie-orsay.fr>
Center Antoine Lacassagne, Nice, France: <http://www.centreantoinelacassagne.org>
PSI, Switzerland: <http://radmed.web.psi.ch>
TERA foundation, Italy: <http://www.tera.it>
Catania, Italy: <http://www.lns.infn.it>
GSI, Germany homepage: <http://www.gsi.de>
HMI Berlin, Germany: <http://www.hmi.de>
Rinecker Proton Therapy Center, Munich, Germany: <http://www.rptc.de>
The Svedborg Laboratory, Sweden: <http://www.tsl.uu.se>
Clatterbridge Centre for Oncology: <http://www.ccoftrust.nhs.uk>
MedAustron, Austria: <http://www.medaustron.at>
ITEP, Moscow, Russia: <http://www.protontherapy.itep.ru>
Tsukuba, Japan - PMRC: <http://www.pmrc.tsukuba.ac.jp/index.html>
HIBMC, Hyogo, Japan: http://www.hibmc.shingu.hyogo.jp/english/aisatu-e_top.htm
HIMAC, Chiba, Japan: <http://www.nirs.go.jp/ENG/nirs.htm> (ENG case sensitive)
IThemba LABS, South Africa: <http://medrad.nac.ac.za/index.htm>

ARTICLES FOR PARTICLES 37

The deadline for articles for the Particles 37 is November 30 2005 and should **NOT** exceed two pages in length. Please send all articles to:

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Northeast Proton Therapy Center
Massachusetts General Hospital
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Telephone: (617) 724-1942
Fax: (617) 724-9532
E-mail: jsisterson@partners.org

PTCOG BUSINESS and FUTURE PTCOG MEETINGS

The Chairperson, Secretary and Steering Committee members are listed below. These appointments run through June 2007. In an effort to provide continuity to PTCOG, the position of Secretary is not limited to 3 years but the Secretary has no voting rights.

Chair: Alfred R. Smith Ph. D.
M. D. Anderson Cancer Center
Department of Radiation Physics
1515 Holcombe Boulevard
Houston TX 77030
E-mail: alsmith@mdanderson.org

Secretary: Allan Thornton M. D.
MPRI
2425 N. Milo B. Sampson Lane
Bloomington, IN 47408
Email: athorn5644@aol.com

MEMBERS OF THE STEERING COMMITTEE

Canada	TRIUMF, BC	E. Blackmore
China	Wanjie, Zibo	L. Jiamin
France	Orsay	L. Feuvret
	Nice	P. Chauvel
Germany	GSI/Heidelberg	D. Schulz-Ertner
	HMI, Berlin	H. Kluge
	RPTC, Munich	J. Hauffe
Italy	Catania, Sicily	L. Raffaele
Japan	HIMAC, Chiba	H. Tsujii
	NCC, Kashiwa	T. Ogino
	PMRC, Tsukuba	Y. Akine
	HIBMC, Hyogo	Y. Hishikawa
	Shizuoka	S. Muruyama
	WERC	S. Fukuda
Korea	NCC, Seoul	J. Kim
Russia	ITEP, Moscow	V. Khoroshkov
	JINR, Dubna	Y. Luchin
	PNPI, St Petersburg	D. Seliverstov
South Africa	IThemba LABS	F. Vernimmen
Sweden	Uppsala	E. Blomquist
Switzerland	PSI	G. Goitein
UK	Clatterbridge	A. Kacperek
USA	NPTC, MGH MA	S. Rosenthal
	LLUMC, CA	J. Slater
	MPRI, IN	
	UCSF, San Francisco, CA	W. Wara
	M. D. Anderson, TX	A. Smith
	FTPI, FL	J. Palta

The times and locations of the next PTCOG meetings are as follows:

PTCOG 43	RPTC, Munich, Germany	December 10 – 14 2005
PTCOG 44	PSI, Switzerland	June 14 – 17 2006
PTCOG 45	M. D. Anderson, Houston, TX, USA	October 8 - 11 2006
PTCOG 46	Open	2007
PTCOG 47	Open	2008

Through 2006, there will be two PTCOG meetings a year. Starting in 2007, the meeting schedule will change to only once each year.

PTCOG 42 STEERING COMMITTEE REPORT Tokyo, Japan, June 2004

Submitted by Al Smith, Chairman: alsmith@mdanderson.org

PTCOG 42 was held at the National Cancer Center in Tokyo, Japan and was hosted by the Japan National Cancer Center and the Shizuoka Cancer Center. The Steering Committee wishes to express their deep gratitude to Dr. Ogino and his associates for this highly successful meeting.

Honorary Members

James Slater, Daniel Miller, Joseph Castro and William Chu were elected as Honorary Members of PTCOG. Honorary Members are those who have made significant contributions to the field of Particle Therapy and have retired from full-time work - they do not have to pay registration fees at PTCOG meetings. The Honorary Membership list includes Herman Suit, Michael Goitein, Kiyomitsu Kawachi, Bernie Gottschalk, Andy Koehler and M. R. Raju.

Travel Fellowship Awards

The Travel Fellowship program is currently sponsored by the following companies, to whom we are very grateful:

- ACCEL
- IBA
- Schär Engineering
- Siemens

A travel fellowship candidate is a person who:

- Is no more than 5 yrs beyond highest degree and has at least one-half yr, and at most 3 yrs, experience in particle therapy.
 - Is a member of, or affiliated with, an existing medical particle facility or a facility being built or is in an advance state of planning.
 - And, whose institution will undertake to cover any additional costs of a fellow's attendance at a PTCOG meeting.
- Note: I erroneously referred to these awards in the last issue of Particles as Student Travel Awards.

Fellowships will provide up to €1'000 for travel/meeting expenses and an additional €500 for travel between continents. The funds will be distributed to travel award recipients at the meeting when the Fellow registers. The hosts of PTCOG meetings are strongly encouraged to discount the registration fees for Travel Fellows – a discount of at least 50% is recommended by the Steering Committee. The Travel Fellowship fund has € 20'000 for the next year (two meetings). The Travel Fellowship Committee plans to fund up to 10 Fellowships for the Munich meeting.

Martin Jermann, PSI, has been chosen as the Treasurer of the Travel Fellowship Funds and appointed as an ex-officio member of the Travel Fellowship Committee. Application forms for travel awards may be obtained from Michael Goitein at: Michael@goitein.ch - applications must be received at least 3 months before the specified meeting date.

[Editor's note: see the separate article below from Michael Goitein to find out how to apply for a Travel Fellowship to attend the meeting in Munich in December 2005]

PTCOG Meetings

The following meetings have been scheduled:

- PTCOG 43: Rinecker Proton Therapy Center, Munich Germany, Dec. 10-14, 2005. Education satellite will be held December 9 at GSI Darmstadt, Germany.
- PTCOG 44: Paul Scherer Institute, Villigen, Switzerland, June 15-17, 2006. Education satellite will be held June 12-14.
- PTCOG 45: M. D. Anderson Proton Therapy Center, Houston, Texas, USA, October 9-11, 2006
-

Beginning in 2007, PTCOG will meet only one time per year. We are soliciting volunteers to host the 2007 meeting. The Steering Committee decided to postpone choosing meeting sites for 2007 and beyond until PTCOG 43 in Munich when we will have better information about new facilities coming on line. The University of Florida, Jacksonville, Florida, USA and the Korean National Cancer Center have expressed their desire to host PTCOG 46. Other bids are welcome. Allan Thornton, MPRI, Bloomington, Indiana, has volunteered to maintain a web site for the purpose of PTCOG meeting registrations – please contact Allan at: athorn5644@aol.com should you wish to discuss this offer.

Education and Training at PTCOG meetings

Ale Mazal and Allan Thornton will assist PTCOG meeting hosts to structure training programs. Weekend programs, either before or after PTCOG meetings, as well as early morning or noon programs, will be developed. Beginning in 2007, we may begin having a one-week training course each year. Ale and Allan will submit a plan for such courses at the Munich meeting.

Vendor Participation at PTCOG meetings

Vendor’s representatives (along with regular PTCOG members) are welcome to attend PTCOG Steering Committee meetings. As a guideline, we suggest that each vendor send one representative. Vendor representatives (as well as members who are not on the Steering Committee) will be non-voting attendants, however they may request to speak or offer comments on topics under discussion. When vendor-related topics are being discussed, the vendor representatives may be requested to leave the meeting during such discussions.

Editor of Particles

Janet Sisterson will continue to be the editor of Particles. Janet has served as the editor of Particles since 1988 and as PTCOG Secretary since about 1993. I announced in Tokyo that Janet had expressed a desire that someone else take over these roles however this was a partial misunderstanding on my part. She is no longer PTCOG Secretary and in fact was very pleased when Allan Thornton of MPRI suggested that he/MPRI folks take over the Secretaryship, which includes maintaining the PTCOG membership database and arranging for the distribution of Particles. However, she is happy to continue to produce Particles and to maintain the world wide patient data base. What she seems to have said is that the distribution of Particles had become a problem and she needed someone else to take over this task or someone to help in solving the distribution problem. I will help with this effort for the next issue of Particles then we will discuss a long range solution in Munich.

I owe my deepest apologies to Martin Jermann who had volunteered at the Tokyo meeting to take over the editorship of Particles after it was announced (erroneously, as it turned out) that Janet Sisterson was retiring from this role. We accepted Martin’s generous offer in Tokyo and it was only after I returned to my office and called Janet did I find out that Janet wished to continue as the Particles editor. It is comforting to know that there are those in the organization who step forward to fill a need and I greatly appreciate that Martin was willing to take on this task.

Particles Newsletter

Martin Jermann at PSI maintains a web site where past issues of Particles are archived. Particle Newsletters are available from 1996 and as recent as January 2005. Janet Sisterson has additional issues of Particles starting from the first issue and she will provide these to Martin for posting on the PSI web site. The web site address is: [<http://ptcog.web.psi.ch/archive.html>]. Martin will also post the current issue of Particles as soon as it is released.

Consolidation of PTCOG funds

We have begun the process of consolidating all PTCOG funds into the bank account currently held at Massachusetts General Hospital. Funds from the San Francisco, Indiana and Tokyo meetings will be transferred to the MGH account. After we have registered PTCOG as a non-profit society (perhaps in Texas) we will establish a bank account under the name of the society and transfer all PTCOG funds into that account.

**NOTICE OF
PTCOG TRAVEL FELLOWSHIPS**

As previously announced, due to the generous assistance of industry, PTCOG is initiating a program of travel fellowships to assist beginning participants in particle therapy to attend PTCOG meetings. For the upcoming meeting in Munich in December, 2005, it is anticipated that some 10 to 12 awards will be made. The awards will be made in euros, at the time of on-site registration, in the following amounts:

fellows coming from outside Europe	€1,500
fellows coming from within Germany	€500
all others	€1,000

A candidate for a travel fellowship must be a person who:

- ❑ is at most 5 years beyond his or her highest degree and has at least one-half a year's, and at most 3 year's, experience in particle beam therapy;
- ❑ is a member of, or at least loosely affiliated with, an institution which must either: have, be building, or be in advanced stages of planning, a medical particle facility.
- ❑ and, whose institution will undertake to cover any additional costs of a fellow's attendance at the society's meeting.

Applications will be accepted from more than one candidate from any given institution. However, an effort will be made to have representation from as wide a geographic area as possible. Travel fellows are not required to present a paper at the meeting.

- **Application forms may be requested by email at “michael@goitein.ch” or by fax to: +41 56 442 5458.**
- **Completed applications must be received by August 25th 2005.**
- **Successful applicants will be notified by October 10th 2005.**
- **The fellowship award will be given to the candidate in Munich at the time of the meeting**

members of the PTCOG travel fellowship selection committee:

Michael Goitein (michael@goitein.ch) - chair

Martin Jermann (martin.jermann@psi.ch) - treasurer

Skip Rosenthal (srosenthal@partners.org)

Allan Thornton (athorn5644@aol.com)

Fred Vernimmen (fv@sun.ac.za)

PTCOG 43
December 10 – 14 2005-07-20
Munich, Germany

The next PTCOG meeting will be hosted by the Rinecker Proton Therapy Center, Munich, Germany. A preliminary program is available on the PTCOG 43 web site at <http://www.ptcog43.com>. In the very near future, information about hotel booking, registration etc. will be available on this web site.

The meeting will start on Saturday December 10 with a workshop on “Protontherapy Basics”, followed on Sunday by the Steering Committee meeting, tours of the facility and a welcome reception. All these events will be held at RPTC. The PTCOG meeting will be held at the conference hotel, starting on Monday morning at 9:00 hours and continuing until Wednesday December 14, finishing at 13:00 hours. There will be an interesting social program as well.

PTCOG Information/News/Reports:

The following reports and articles were received by July 2005.

[The University of Texas M. D. Anderson Proton Therapy Center:](#) Update on the Facility, Equipment Installation and Clinical Preparations July 2005.

The University of Texas M. D. Anderson Proton Therapy Center (MDA-PTC) will begin patient treatments in the first quarter of 2006. All of the proton therapy hardware and software supplied by Hitachi, Ltd. has been installed in the facility. Hitachi has installed all accelerator and beam transport systems and has tested the vacuum and magnet systems. RF testing on the linac injector has been completed and beam will be extracted the first week in August. There was some delay in starting up the accelerator systems due to a cooling water problem however these problems have been resolved. The treatment control and safety systems are being tested. The Acceptance Tests for Gantry #1 have been completed and the Acceptance Tests for the couch in that room will be completed in July. Beam test on the Gantry #1 treatment delivery nozzle will begin in October.

Testing is underway for the interface between the Varian Eclipse proton treatment planning system and the IMPAC data management system and for the interface between IMPAC and the Hitachi control system. Development is continuing on the interfaces between IMPAC and the machine shop and between IMPAC and the facility quality assurance and calibration systems. The installation of the CT-SIM will begin in late July. The PET/SIM and MRI devices will be installed in 2006.

The clinical version of the passive scattering Varian Eclipse proton treatment planning system will be delivered in August. Pre-Clinical Commissioning data for the Eclipse system has been generated by Monte Carlo calculations – this data will permit testing and training on the Eclipse system until actual data can be measured.

Clinical Teams at M. D. Anderson Cancer Center are developing treatment protocols, immobilization devices and clinical procedures in preparation for patient treatments.

Questions about the M. D. Anderson Proton Therapy Center can be directed as follows:

- Clinical: James Cox - jcox@mdanderson.org
- Facility: Amy Hay - ahay@probeamoncology.com
- Program and Clinical Operations: Mitch Latinkic - mlatinkic@mdanderson.org

Questions about ProBeam Oncology, the Partnership that was formed to develop, fund and operate the PTC-H, can be directed to:

- Bruce McMaken bruce.mcmaken@smhgroup.com or John Styles johnjr@probeamoncology.com

Al Smith, M. D. Anderson Cancer Center, Dept. of Radiation Physics, 1515 Holcombe Boulevard, Houston, TX 77030, alsmith@mdanderson.org.

Status of patient treatments at Wanjie, Proton Therapy Center (WPTC), China:

The first patient was treated in the horizontal beam room on December 20, 2004. The first patient treatment in the Gantry room began on April 18, 2005. Until now, (mid June 2005) 33 patients were successfully treated with proton or protons combined with photons in our center, including: chordoma, meningioma, pituitary adenoma, glioma, acoustic neuroma, nasopharyngeal carcinoma, hepatic cancer, lung cancer, pancreatic cancer and carcinoma of uterine cervix.

We purchased a Proteus 235 PTS from IBA with a 230MeV fixed energy cyclotron. We have one fixed beam room and three gantry rooms in total, now there is only one horizontal beam room and one gantry room in operation, the other two gantry rooms are waiting for the facilities. The horizontal beam room can only be used for eye, brain, head and neck diseases because the patient must seat in a chair to accept proton therapy. Eye disease can only be treated when eye plan from Varian is ready for clinical use, it was said that it should be ready for clinical purpose at the end of this year. The treatment planning system is Varian-- Eclipse proton. We have a dedicated CT from GE to scan the patients; sometimes we use MRI fusion to draw the GTV. Mask and bite block was used for immobilization. Couch can move in six degrees. We use DRRs to make sure the positioning accuracy is within 1mm. Apertures are made of brass and compensators are made of Lexan by a milling machine. *Dr. Li Jiamin, Wanjie Proton Therapy Center (WPTC), Wanjie Hospital, Zibo City, Shangong, China.*

The Rinecker Proton Therapy Center, Munich, Germany: First Beam in RPTC Gantry 1 - Successful Scanning Tests

On May 29, 2005, first beam was delivered to the isocenter of the first Gantry room at the Rinecker Proton Therapy Center (RPTC) in Munich in order to verify the cyclotron beam energy. A proton beam was extracted out of the cyclotron and guided to the isocenter of Gantry 1. The beam quality was excellent with regard to beam current stability, energy spread and beam focus at the isocenter already on the very first attempt, resulting in an instantaneous measurement of the depth dose distribution shown in Figure 1.

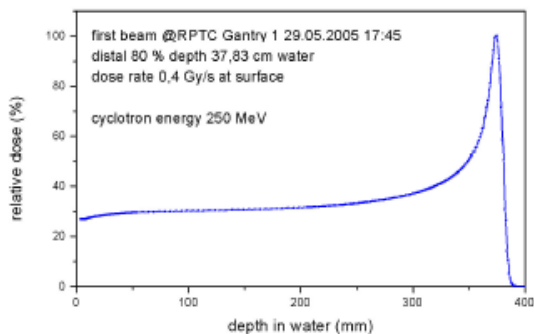


Figure 1: Depth dose distribution at Isocenter

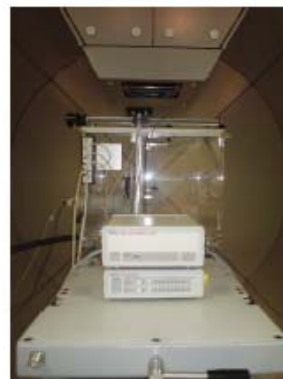


Figure 2: Setup with water phantom

Measurements were performed with a PTW MP3-M water phantom and large-diameter parallel plate ionization chambers developed in collaboration with PTW for the special needs of measurements with proton pencil beams.

The measured range in water was converted to proton beam energy based on the ICRU 49 stopping power and range tables. After the application of corrections for energy losses in the air gap and the nozzle monitor chamber system, a cyclotron energy of 250,2 MeV was calculated. The uncertainty of this value is about $\pm 0,2$ MeV.

Shape and parameters of the Bragg curve confirm that the design goals of the ACCEL 250 MeV superconducting medical proton cyclotron were met in every point, thus providing an excellent proton beam quality and superior energy compared to other cyclotron solutions.

Since May 2004, a team of physicists from ACCEL has regularly been testing the ACCEL scanning nozzle under beam operation at the Hahn-Meitner Institute Berlin (HMI) using the 70 MeV proton beam. The scanning system is designed to deliver spot scanned fields up to sizes of 30 cm x 40 cm with a 70 - 250 MeV proton beam. Test issues were the performance of the system with regard to position precision, decoupling of x- and y-scanning and dose homogeneity.

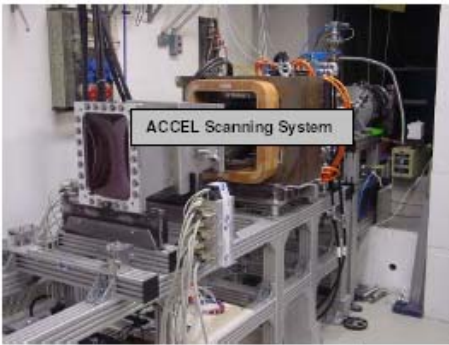


Figure 3: Setup of the scanning nozzle tests at HMI Berlin. Visible are the scanning magnets and the vacuum exit window



Figure 4: RPTC gantry treatment room No.1 with scanning nozzle and patient positioner

The test setup is shown in figure 3, the nozzle on one Gantry at RPTC in figure 4. The first tests already demonstrated a good agreement with the technical demands. Furthermore, the fast switching times of the scanning control system in case of failures in the scanning control system for dose monitor interlocks and for position monitor interlocks were successfully verified. Another important test issue was the overlap of patched fields scanned in different runs which is a very important safety issue concerning the continuation of interrupted irradiations. In several tests with different settings no dose peaks or valleys were found at the margins of patched fields. Some test results are displayed in figure 5 and 6 showing a spot raster scan demonstrating the linearity of the x- and y scanning magnets and the dose homogeneity achieved with the scanning system, respectively. Thus, the scanning system can be considered to be ready for clinical use.

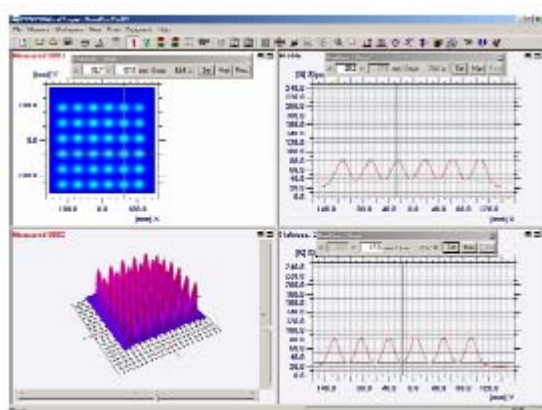


Figure 5: Test results of applied spot rasters

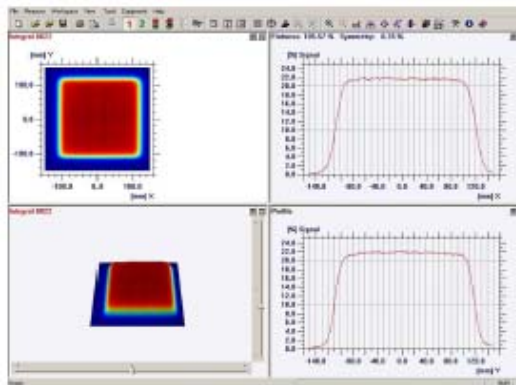


Figure 6: Homogeneous dose distribution applied with the scanning system

First tests of the scanning system were performed at RPTC with 250 MeV beam energy after the pretesting phase with 70 MeV at HMI Berlin. Again, homogeneous fields of 20 x 20 cm² and single spot distributions were applied. Results confirm the reported successful tests at HMI. *For further information please contact: Dr. Michael Schillo, ACCEL Instruments GmbH, Friedrich-Ebert-Straße 1, D-51429 Bergisch Gladbach, Phone +49 (22 04) 84-23 39, Fax +49 (22 04) 84-25 01, E-Mail schillo@accel.de*

ACCEL and Ansaldo Superconduttori Cooperate on a Novel Superconducting "Multiparticle" Proton/Ion Cyclotron for Hadron Therapy of Tumors with the LNS/Catania Laboratory of the INFN.

INFN President Professor Roberto Petronzio on 16 June 2005 announced at the occasion of the opening of the latest HCPBM meeting in the Sanctuary di Oropa near Biella that an agreement has been concluded between the INFN, ACCEL Instruments GmbH, and Ansaldo Superconduttori to develop a novel superconducting multiparticle cyclotron for Hadron Therapy based on a conceptual idea developed at INFN Laboratori Nazionali del Sud.

In order to combine the advantages of a superconducting cyclotron with the quest to accelerate different species of ions in addition to protons, INFN has developed a concept of a multiparticle therapy cyclotron based on LNS Catania's extensive experience both with cyclotron technology and operation and with its successful proton therapy programme for eye treatments. Such experience and competence together with commercial and technical considerations on size and weight for transport, handling, and operational environment led to a machine concept allowing for 250 AMeV protons and light ions. Due to their higher interaction in human tissue Carbon ions will have limited penetration depth, however, still covering a relevant set of treatment cases as is shown by Japanese ion therapy statistics.

It is the goal of the newly formed cooperation between INFN, ACCEL, and Ansaldo Superconduttori to design this multiparticle cyclotron for introduction into the worldwide clinical ion/proton therapy market as a more cost effective and less operator/maintenance intensive solution with somewhat reduced energies for higher ions (e.g. Carbon) but superior beam characteristics compared to synchrotron based installations.

ACCEL Instruments GmbH is a leading supplier for accelerator and magnet systems for research, industry, and health care worldwide, based near Cologne, Germany. **Ansaldo Superconduttori SpA** is one of the larger superconductive and resistive magnet suppliers for accelerator and fusion research centers, based in Genova, Italy. **INFN** is the Italian National Institute for Nuclear Physics. This agency is responsible for the Italian research in the field of the subnuclear, nuclear and astroparticle physics study where it is at the forefront with the major international research centres.

Dr. Hans-Udo Klein, ACCEL Instruments GmbH, Friedrich-Ebert-Str. 1, 51429 Bergisch Gladbach, Germany, klein@accel.de, Davide Malacalza, Ansaldo Superconduttori SpA, Corso Perrone, 73 r, 16152 Genova, Italy, dmalacalza@trametal.it, Roberto Pretonzio, INFN, presidenza@presid.infn.it.

OncoLink: the largest website in the world for cancer information.

The website, at <http://www.oncolink.upenn.edu> currently gets 8 – 11 million hits per month making it one of the busiest healthcare sites in the world and an international resource for both physicians and patients. A dedicated section on proton therapy is being added to this website, which will certainly increase the visibility of proton therapy throughout the world. At the present time, this section is under construction and help is sought from all in the proton therapy community to make sure that we have the most pertinent, correct and up-to-date information as possible. Please visit the site, see what is there already and send me any comments or additional information. *James. M. Metz, Editor-in-Chief, OncoLink, University of Pennsylvania, 3400 Spruce Street, 2 Donner Bldg, Philadelphia, PA 19104, Metz@xrt.upenn.edu.*

History of the Harvard Cyclotrons

The Harvard Cyclotron Laboratory may no longer exist but Dick Wilson, Professor Emeritus, Harvard University has made sure that it will not be forgotten by establishing a web site which records the history of the Harvard Cyclotrons. The first cyclotron was sent to Los Alamos and never came back. Parts of it were in existence until recently. The second Harvard Cyclotron operated from 1949-2002.

The web-based history has many photographs, information and a list of all papers published by members of the Harvard Cyclotron staff over the years. Additional information can be added to this history at any time. The web site is: <http://phys4.harvard.edu/%7EWilson/cyclotron/history.html>.

In addition to this web based history, a small hard copy book (and in paperback), dedicated to Andreas (Andy) Koehler, has been published by the Harvard University Physics Department and is on sale at the Harvard University Press. <http://www.hup.harvard.edu/catalog/WILHIM.html>. This book can also be purchased through Amazon.com.

Janet Sisterson

TREATMENT PLANNING SYSTEMS FOR PROTON AND ION BEAM THERAPY

July 2005

The following Table is an extension of that originally presented in October 1999 by Skip Rosenthal, MGH at the Workshop on Treatment Planning Systems, PTCOG XXXI. Please send corrections/additions to Janet Sisterson.

Year	Created By	System Name	Status
1979-93	LBL	LBL system	Not Available
1980	MGH	Rx	Distributor MGH
1980	MGH	EYEPLAN	Distributor MGH – EYES only
1990-96	MGH/Seimens	V-Treat(AXIOM)	Not Available
198?,1991	PSI	PSI system/Pion	Distributor PSI
1995	DKFZ/Royal Marsden	Voxelplan/Proxelplan	Adapted by NAC, DKFZ
1996	Radionics/MGH/HCL	P-Knife	Not Available
1997	LLUMC/PerMedics	OptiRad 3D	FDA approved; commercial
1998	Tsukuba	Hitachi system	In-house system
1998	NCC/SHI	PTplan	In-house system
1998	DKFZ	OCTOPUS	Under development – EYES only
1994	Orsay/Curie	ISIS	Distribution ?
1998	CMS/MGH	FOCUS	Commercial Release 1999
1998	DKFZ	KonRad Plus Protons	Research Only
1989 – 2000	CCO, Clatterbridge, UK	EYEPLAN v1.6 (VMS)	Available free;eyes only; research only
1999	GSI	TRiP98	Research, Clinical, Scanned Ions
2000	Varian	Polaris	FDA approved for passive treatment modalities
2001	ITEP (Moscow)	ProGam	Adapted in PTF ITEP
2002	MDS Nordion	Helax-TMS	FDA approved: commercial
2002	CMS/Mitsubishi	FOCUS/M	Commercial Release 2001
	RenderPlan		?
	Adac		?
	Michigan		?

Proposed NEW FACILITIES for PROTON & ION BEAM THERAPY - July 2005

INSTITUTION	PLACE	TYPE	1 ST RX?	COMMENTS
Rinecker, Munich	Germany	p	2005	4 gantries, 1 fixed beam, 250 MeV, scanning beams.
NCC, Seoul	Korea	p	2006	230 MeV cyclotron, 2 gantries, 2 horiz, 1 exp horiz.
FPTI, U. of Florida	FL, USA	p	2006	230 MeV cyclotron, 3 gantries, 1 fixed.
PSI	Switzerland	p	2006	Addition of a 250 MeV cyclotron, 2 nd gantry, new 1 fixed
M. D. Anderson Cancer Center	TX, USA	p	2006	250 MeV synchrotron; 3 gantries; 1 fix(2 beams)+1 exp rooms
Heidelberg	Germany	p, ion	2007	1 gantry; 2 fixed beam; p/carbon; int. contr. Raster scan
CNAO, Pavia	Italy	p, C-ion	2007	Synchrotron 400 MeV/u. 3 horiz, 1 vertical beam
iThemba LABS, Somerset West	South Africa	p	2008	230 MeV, 2 gantry, horiz. + 30° beams.
Med-AUSTRON	Austria	p, ion	2009	p gantry; ion gantry; 1 fixed rm with p and C lines; 1 exp room
Rinecker, Cologne	Germany	p	2008?	4 gantries, 1 fixed beam, 250 MeV, scanning beams.
Trento, Italy	Italy	p	2008?	cyclotron; 1 gantry; 1 fixed
IMP, Lanzhou	PR China	C-Ar ion	?	C-ion from 100MeV/u and p (120 MeV) at HIRFL; clin. treat;biol. research; no gantry; shifted patients
Chang An Information, Beijing	China	p	?	235 MeV Cyclotron, under construction.
CGMH, Northern Taiwan	Taiwan	p	?	250MeV synchrotron/230MeV cyclotron;3 gantry,1 fixed
Bratislava	Slovakia	p, ion	?	72 MeV cyclotron; p; ions; +BNCT, isot prod.
Erlangen	Germany	p	?	4 treatment rooms, some with gantries.
TOP project ISS Rome	Italy	p	?	70 MeV linac; expand to 200 MeV?
3 projects in Moscow	Russia	p	?	including 320 MeV; compact, probably no gantry
Krakow	Poland	p	?	60 MeV proton beam.
Proton Development N.A. Inc.	IL USA	p	?	300 MeV protons; therapy & lithography

WORLD WIDE CHARGED PARTICLE PATIENT TOTALS

July 2005

WHO	WHERE	WHAT	DATE FIRST RX	DATE LAST RX	RECENT PATIENT TOTAL	DATE OF TOTAL
Berkeley 184	CA. USA	p	1954	— 1957	30	
Berkeley	CA. USA	He	1957	— 1992	2054	
Uppsala (1)	Sweden	p	1957	— 1976	73	
Harvard	MA. USA	p	1961	— 2002	9116	
Dubna (1)	Russia	p	1967	— 1996	124	
ITEP, Moscow	Russia	p	1969		3833	July-05
Los Alamos	NM. USA	π^-	1974	— 1982	230	
St. Petersburg	Russia	p	1975		1281	May-05
Berkeley	CA. USA	ion	1975	— 1992	433	
Chiba	Japan	p	1979		145	Apr-02
TRIUMF	Canada	π^-	1979	— 1994	367	
PSI (SIN)	Switzerland	π^-	1980	— 1993	503	
PMRC (1), Tsukuba	Japan	p	1983	— 2000	700	
PSI (72 MeV)	Switzerland	p	1984		4182	July-05
Uppsala (2)	Sweden	p	1989		418	Jan-04
Clatterbridge	England	p	1989		1372	Dec-04
Loma Linda	CA. USA	p	1990		10324	July-05
Louvain-la-Neuve	Belgium	p	1991	— 1993	21	
Nice	France	p	1991		2861	July-05
Orsay	France	p	1991		2805	Dec-03
iThemba LABS	South Africa	p	1993		475	May-05
MPRI (1)	IN USA	p	1993	— 1999	34	
UCSF - CNL	CA USA	p	1994		632	June-04
HIMAC, Chiba	Japan	C ion	1994		1796	Feb-04
TRIUMF	Canada	p	1995		98	July-05
PSI (200 MeV)	Switzerland	p	1996		230	July-05
G.S.I Darmstadt	Germany	C ion	1997		198	Dec-03
H. M. I, Berlin	Germany	p	1998		604	July-05
NCC, Kashiwa	Japan	p	1998		300	Oct-04
Dubna (2)	Russia	p	1999		318	July-05
HIBMC, Hyogo	Japan	p	2001		617	May-05
PMRC (2), Tsukuba	Japan	p	2001		656	June-05
NPTC, MGH	MA USA	p	2001		1167	July-05
HIBMC, Hyogo	Japan	C ion	2002		39	May-05
INFN-LNS, Catania	Italy	p	2002		82	Oct-04
WERC	Japan	p	2002		19	Oct-04
Shizuoka	Japan	p	2003		195	July-05
MPRI (2)	IN USA	p	2004		21	July -04
(WPTC) Wanjie	China	p	2004		33	Jun-05
					1100	pions
					4520	ions
					42766	protons
				TOTAL	48386	all particles