

Future ICCHIBAN Experiments Using Proton Beams

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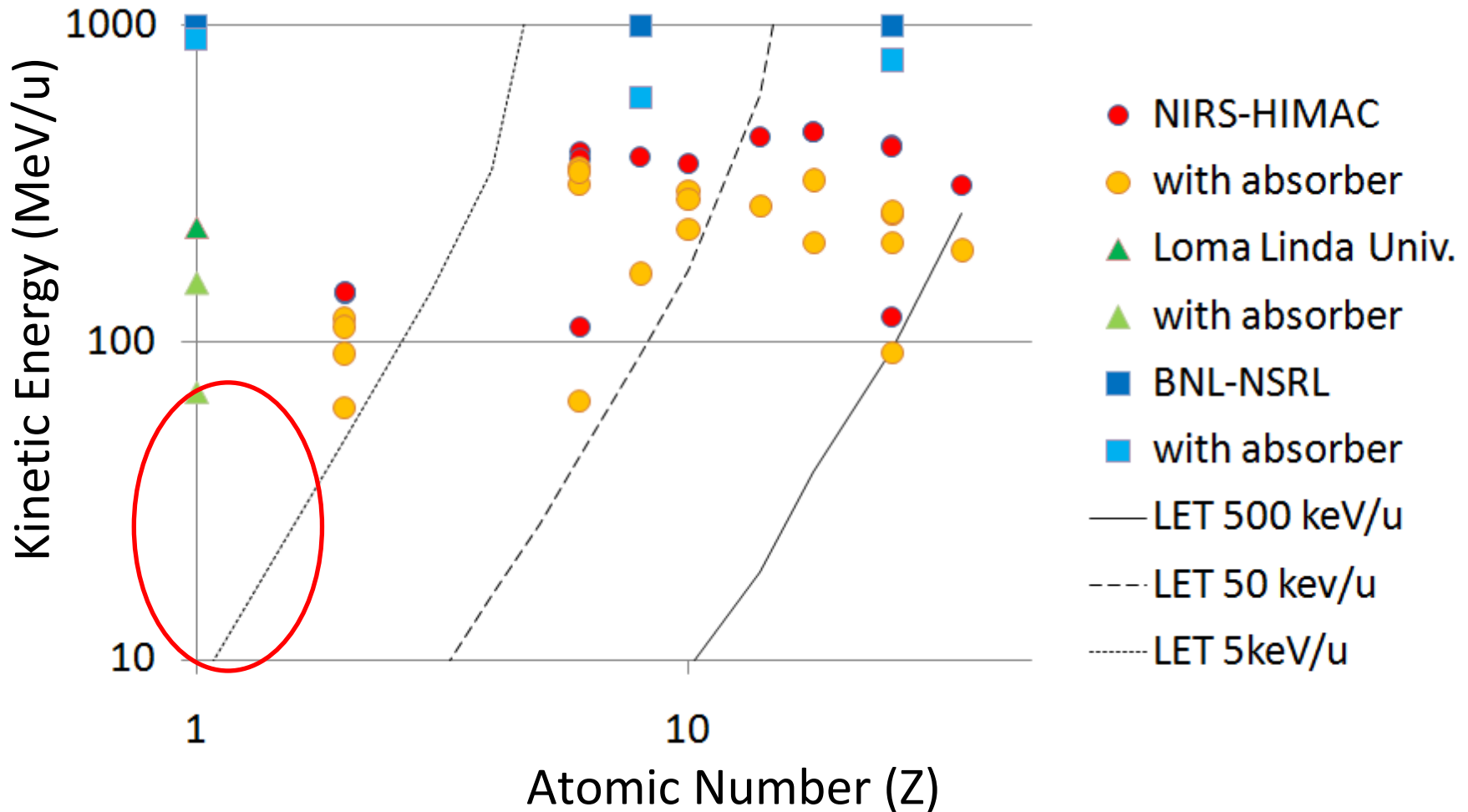
on behalf of ICCHIBAN Working Group and Participants

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Contents

- Overview of past ICCHIBAN-experiments
- ICCHIBAN using low LET beams
- NIRS-Cyclotron facility
 - Characteristics
 - Beam profile
- Plan of the experiment
- Database for Passive Detectors
- Summary

Ion beams used at past ICCHIBANs

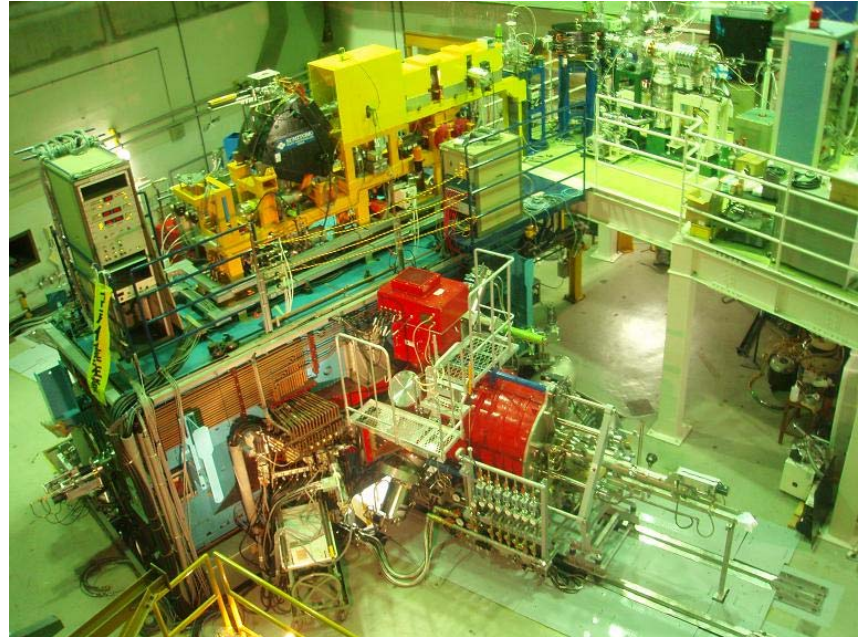


ICCHIBAN using low LET beams

- Past ICCHIBAN experiments targeted the response for high LET particles using heavy ion beams.
- In NIRS, there is a cyclotron which has capability to accelerate protons up to 70 MeV (LET is about 1keV/micron).
- Low LET beams are useful for TLD/OSLD.

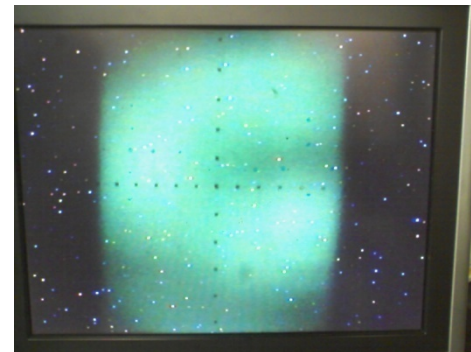
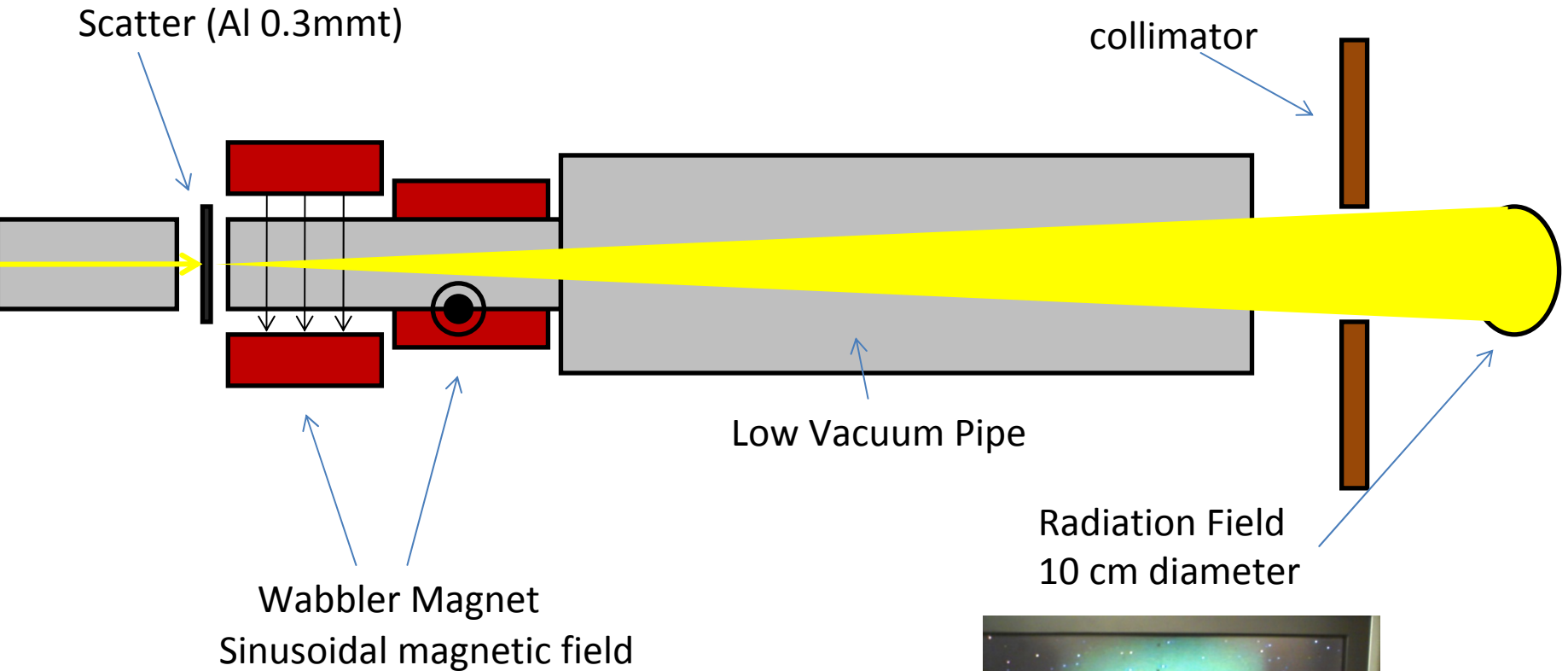
Specification of the NIRS-Cyclotron

- Type: AVF Cyclotron
- Beams:
 - proton 5-80 MeV
 - deuteron 10-55 MeV
 - ^3He 18-147 MeV
 - ^4He 20-110 MeV
 - Heavy ions ...



- This cyclotron is used to produce radioisotopes for SPECT/PET mainly.
- It is usable for scientific experiments about one day per a week.
- Typical experiment time is from 11 am to 7 pm (8 hours).

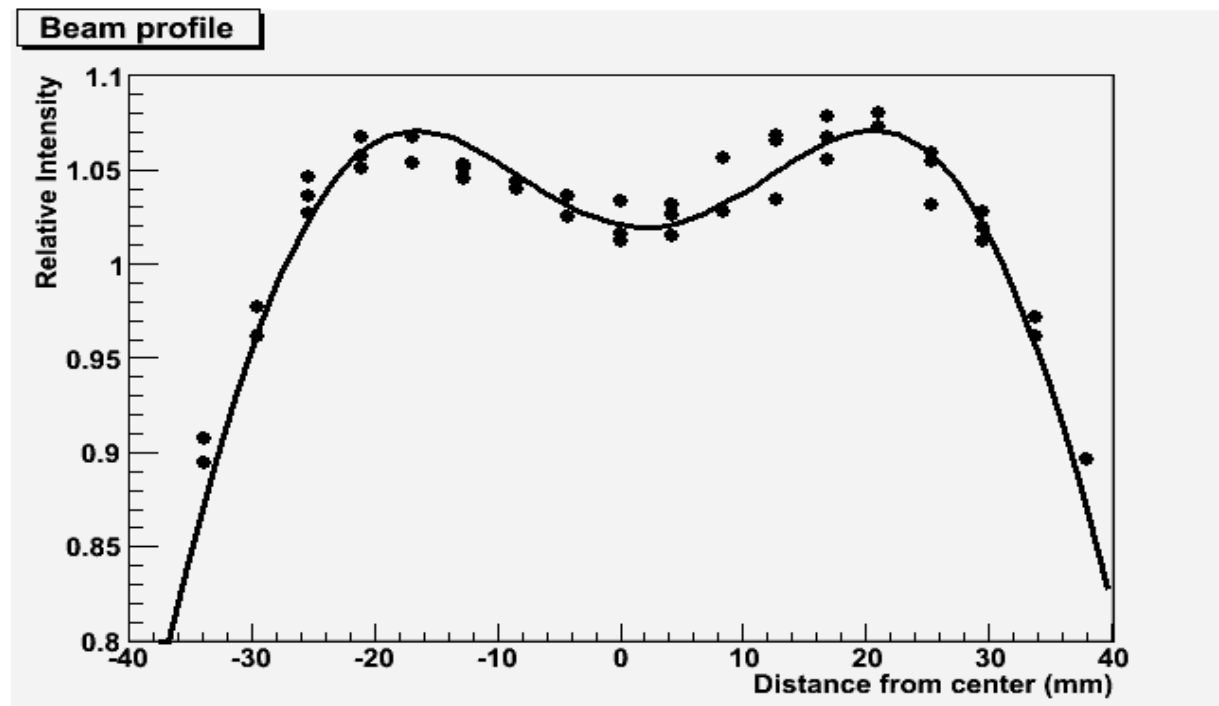
Wide-spread Beam Course (C-8)



Beam image on a luminescence plate

Characteristics of beams

- **Example:** 70 MeV proton
 - Dose rate: < 1 Gy/sec
 - Beam spot size: 6 cm diameter



Plan

- Objects: Passive detectors and active detectors that are battery powered (e.g. Liulin-4).
- Beams:
 - 30 MeV proton (2 keV/micron)
 - 70 MeV proton (1 keV/micron)
 - 100 MeV ^4He (9 keV/micron)
 - ??

Time Schedule

Year	Month	
2009	April-July	Tests to make wide beams.
	August	Beam time will be fixed.
	September	Announcement in next WRMISS
2010	February (?)	ICCHIBAN Experiment at NIRS-Cyclotron

Data collection for previous passive ICCHIBAN experiments

- According to our discussion at WRMISS 12, The ICCHIBAN working group (ICWG) decides to collect and summarize the results from past ICCHIBAN experiments.
- Collected data will be opened for participants on the ICCHIBAN web site*.

* <http://www.nirs.go.jp/ENG/rd/1ban/index.html>

1	Type	combined		Low LET Dose (mGy)	Total Dose (mGy)	Total Dose Equivalent (mSv)			
2	Ion	Exposure name	Detector Name	Value	Error	Value	Error	Value	Error
3	He150	1mGy Linearity							
4	He150	10mGy Linearity							
5	He150	50mGy Linearity							
6	He150	100mGy Linearity							
7	He150	Fragment							
8	C400	1mGy Linearity							
9	C400	10mGy Linearity							
10	C400	50mGy Linearity							
11	C400	100mGy Linearity							
12	C490	Fragment							
13	Si490	1mGy Linearity							
14	Si490	10mGy Linearity							
15	Si490	50mGy Linearity							
16	Si490	100mGy Linearity							
17	Si490	Fragment							
18	Fe500	1mGy Linearity							
19	Fe500	10mGy Linearity							
20	Fe500	50mGy Linearity							
21	Fe500	100mGy Linearity							
22	Fe500	Fragment							
23	Blind	1							
24	Blind	2							
25	Blind	3							
26	Blind	4							

Excel format files will be sent to the ICCHIBAN participants soon.

Summary

- ICWG is planning the future ground-base experiment using the NIRS-Cyclotron.
- Schedule is not fixed because of the limitation of machine time. It will be the end of 2009 or the beginning of 2010.

Thank you for your attention!

