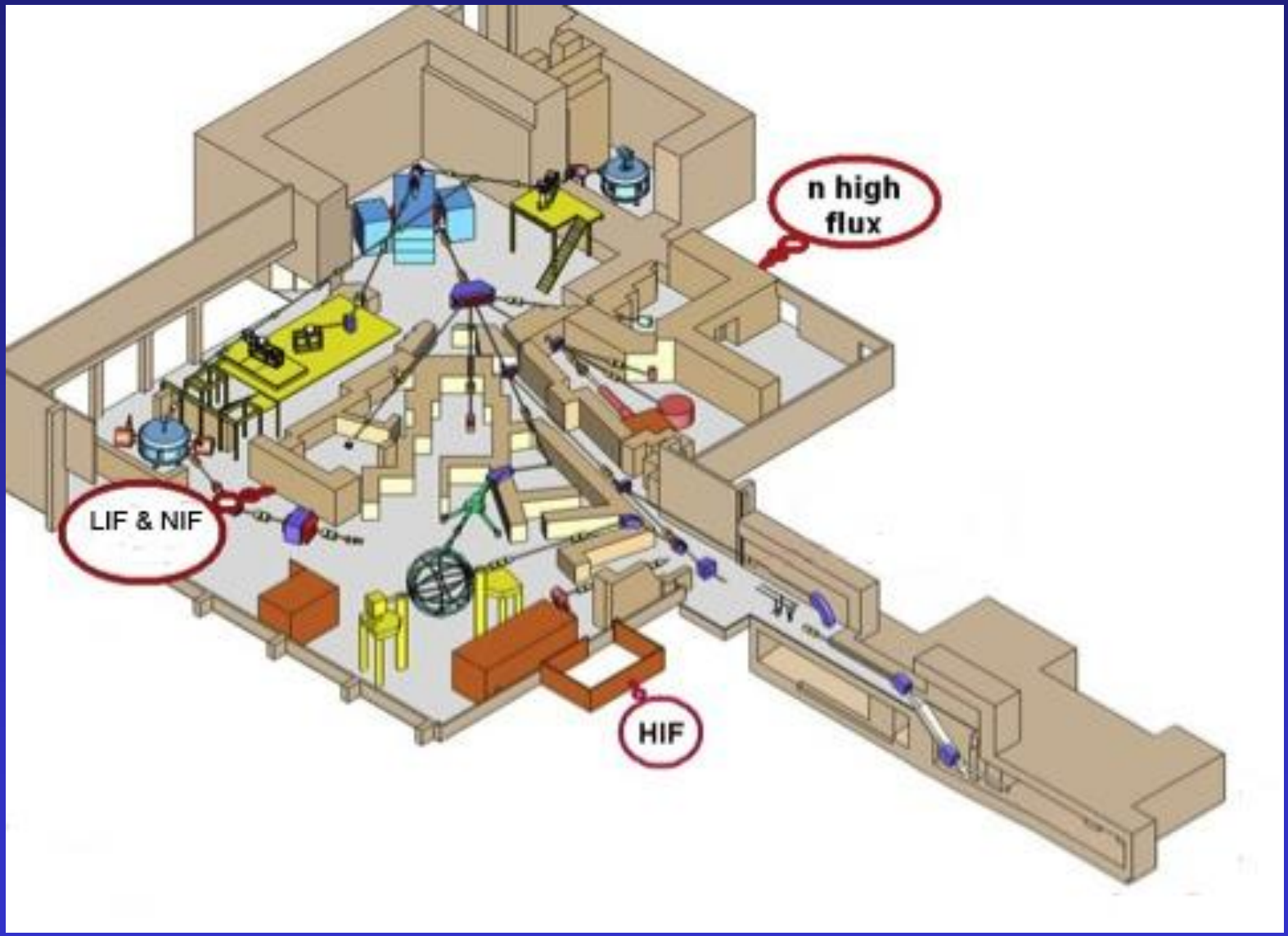
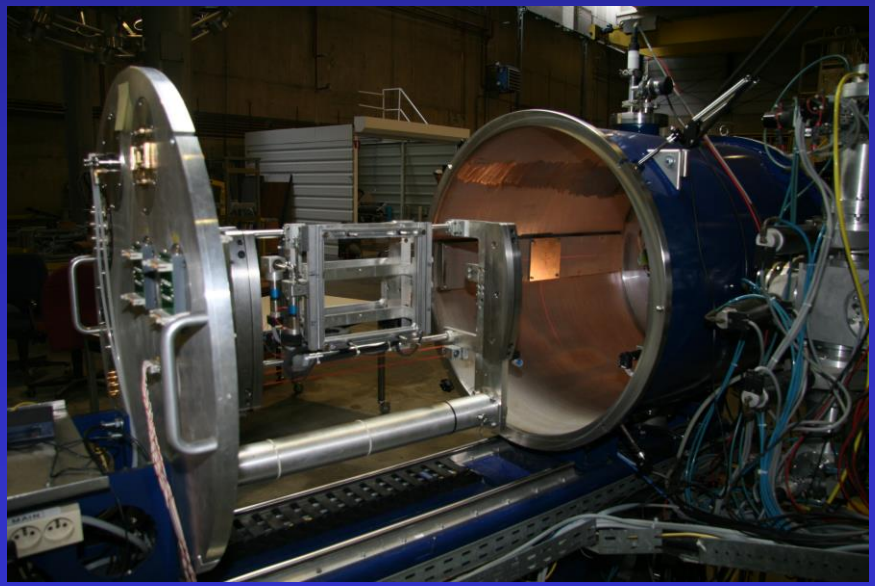
AIDA Second Annual Report

UCL, Belgium

Guy Berger


n high
flux
LIF & NIF
HIF

Heavy Ion irradiation Facility (HIF)



Ion	Energy [MeV]	LET [MeV/mg/cm^2]	Range [microns]
$^{13}C^{+4}$	131	1.2	266
$^{22}Ne^{+7}$	235	3.6	199
$^{40}Ar^{+12}$	372	9.95	119
$^{58}Ni^{+18}$	567	21.3	98
$^{83}Kr^{+25}$	756	31.0	92

Flux: from a few ions/s cm^2 to 2 E 4 i/ s cm^2

Beam spot: 25 mm

Fast ion changing

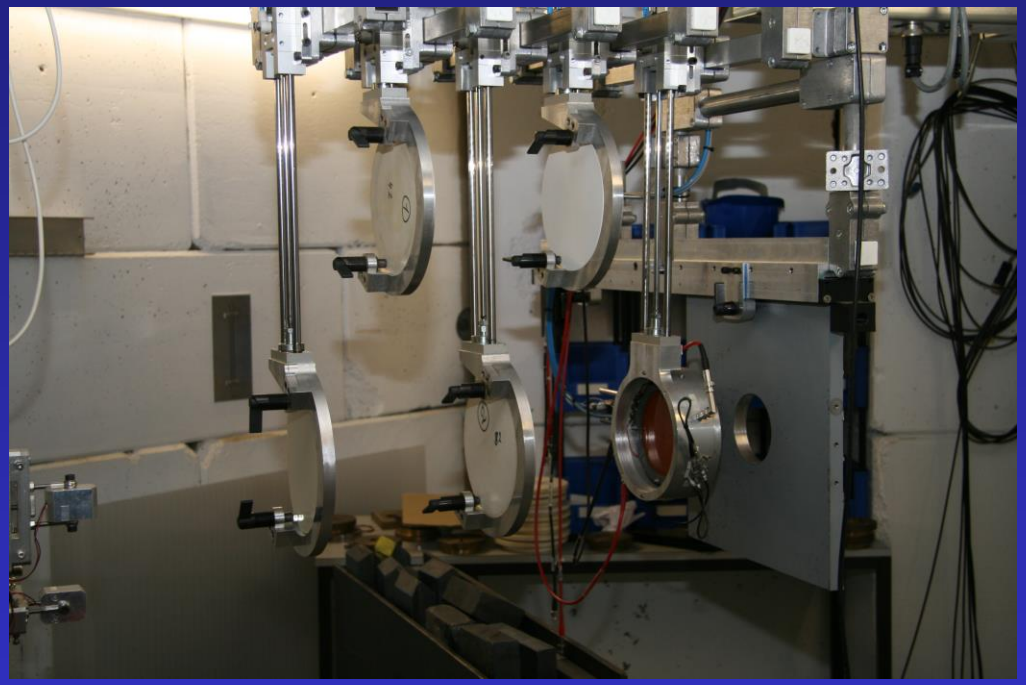
Ion	Energy [MeV]	LET [MeV/mg/cm^2]	Range [microns]
$^{15}N^{+3}$	62	3.3	64
$^{20}Ne^{+4}$	78	6.2	45
$^{40}Ar^{+8}$	150	15.9	42
$^{84}Kr^{+17}$	316	40.1	43
$^{132}Xe^{+26}$	459	67.7	43

Upgrades:

New ECR source (large LET with high penetration)

Magnetic wobbling

Light Ion irradiation Facility (LIF)

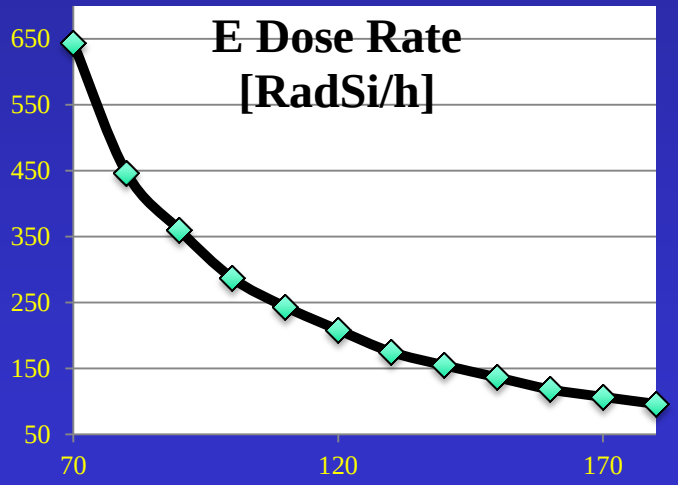


- Homogeneity: ± 10 % on a diameter of 8 cm
- Spot size: fixe brass collimator from 1 cm to 8 cm in diameter
- Flux: between a few p/s cm^2 and 5 10^8 p/s cm^2

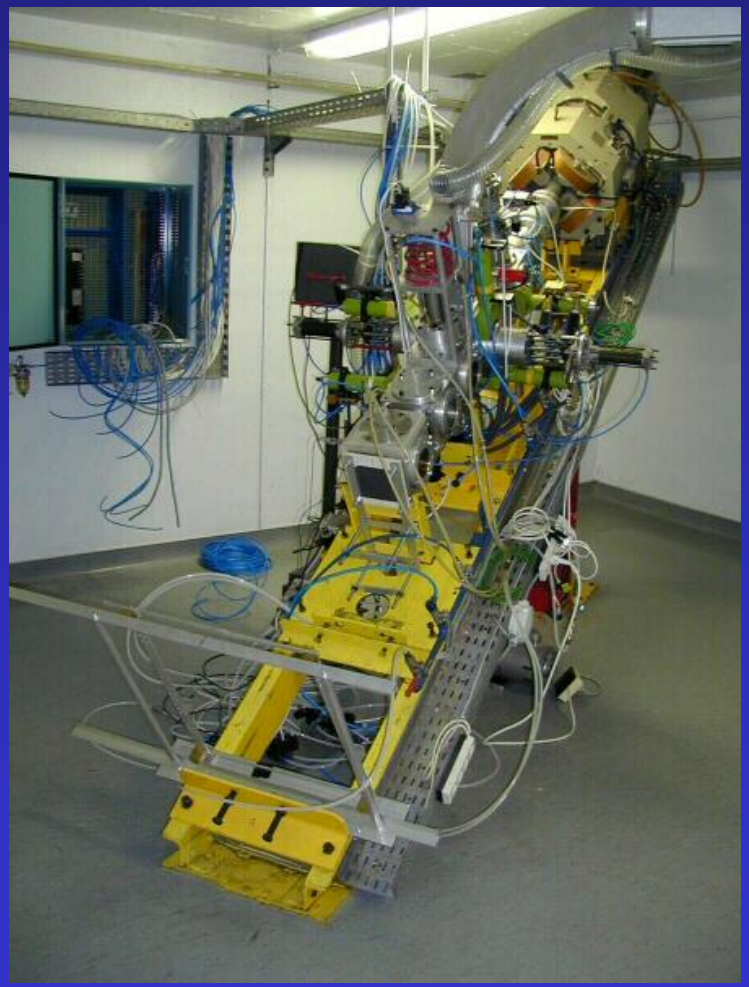
Gamma Irradiation Facility (GIF)

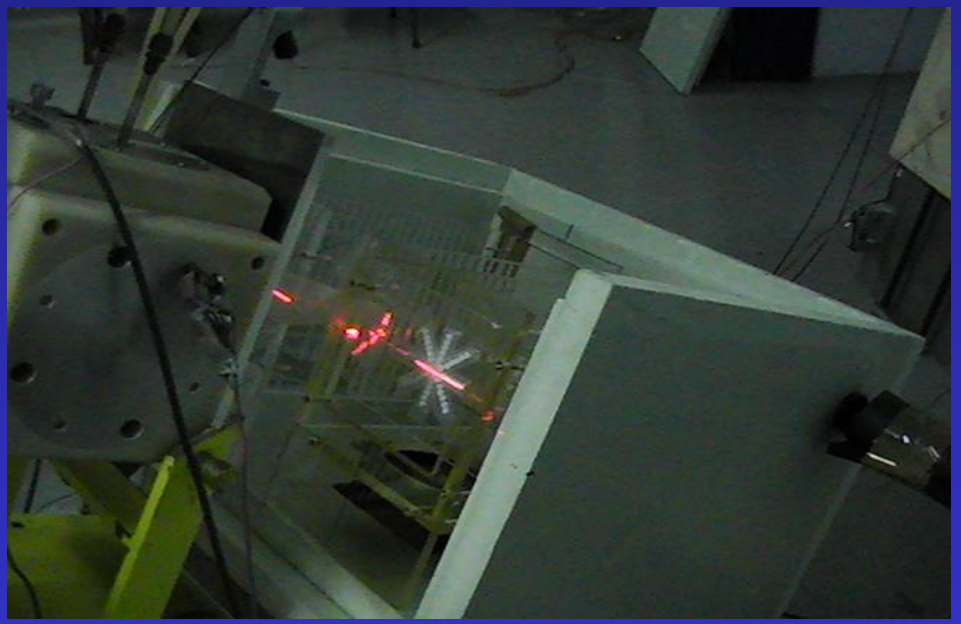
Panoramic irradiator

Source: Co 60

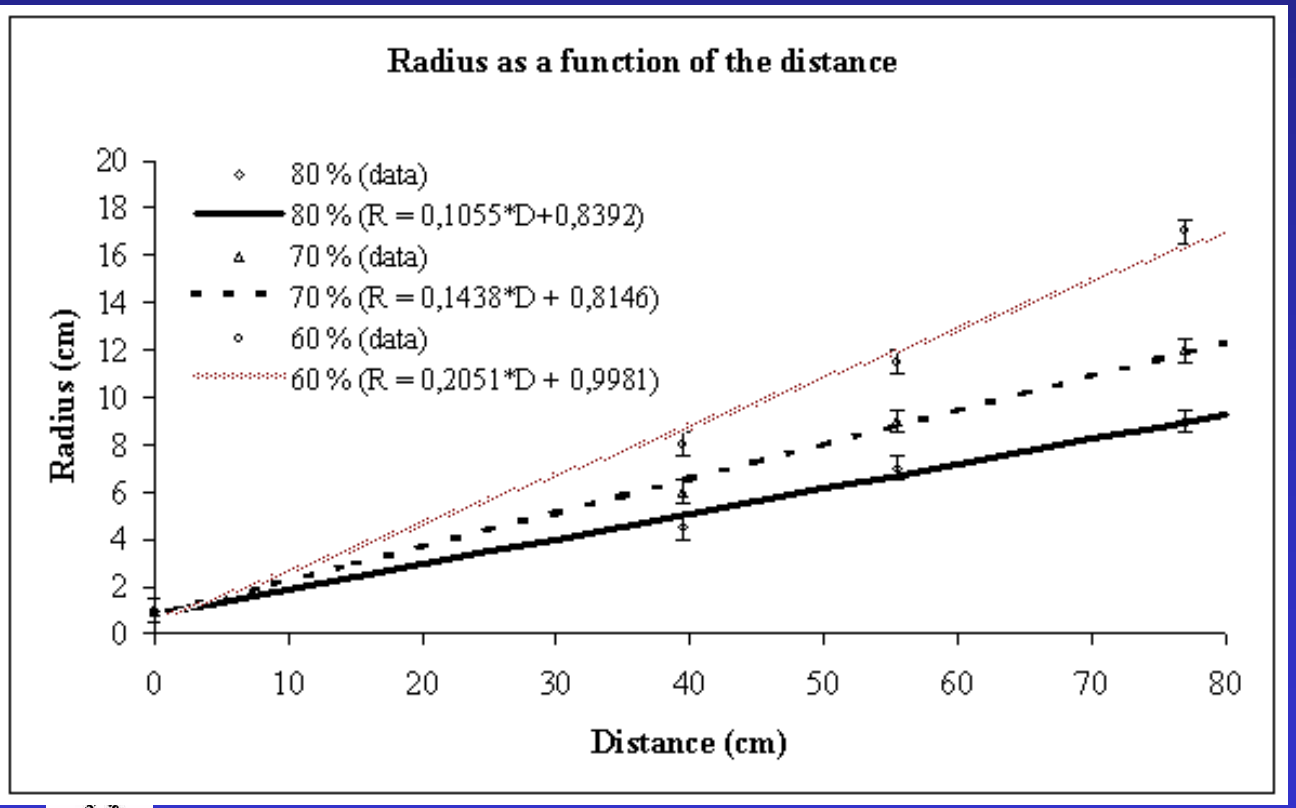


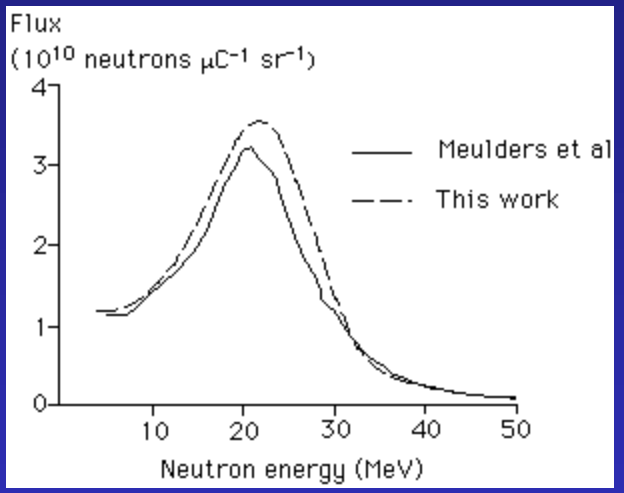
High Flux Neutron IrradiationFacility (HF-NIF)





- Reaction: $^{9}Be + d \rightarrow n + X$ using a 50 MeV beam
  1 cm thick target
- Typical flux: $7.3 * 10^{10}$ neutrons / cm^2 s at 9 cm from target
- Irradiation temperature down to -30 ° C





Beam contamination:

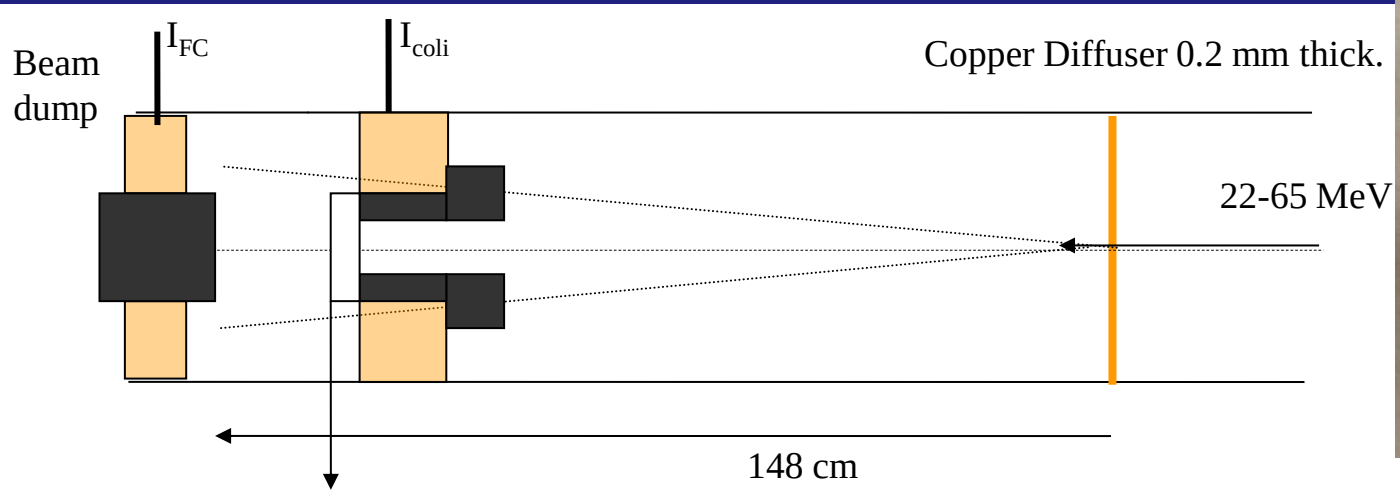
Particle type	Fraction
Neutrons	1
Protons	$1.5\ 10^{-4}$
Electrons	$1.6\ 10^{-4}$
Gamma	$2.4\ 10^{-2}$

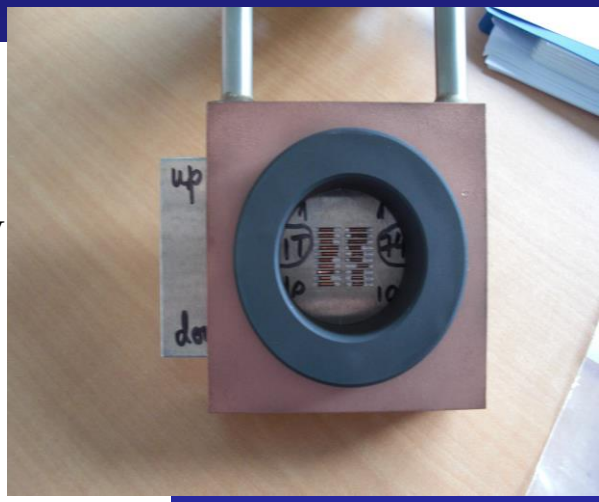
Typical values for 10^{14} neq:

For a 10 μA beam

Dist. to target [cm]	Radius 80 % [cm]	Radius 70 % [cm]	Irrad Time [h]
5	1,4	1,5	0:20
10	1,9	2,2	0:35
20	3	3,5	2:20
30	4	5	5:00
40	5	6,5	8:50
50	6	8	13:30
60	7	9,5	19:00

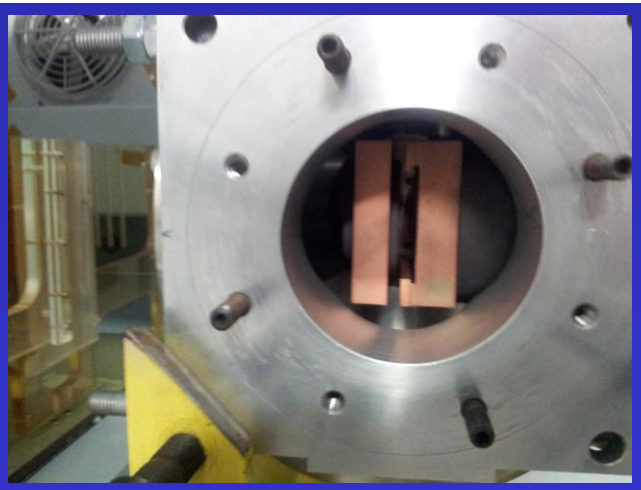
High Flux Proton Irradiation Facility (HF-PIF)

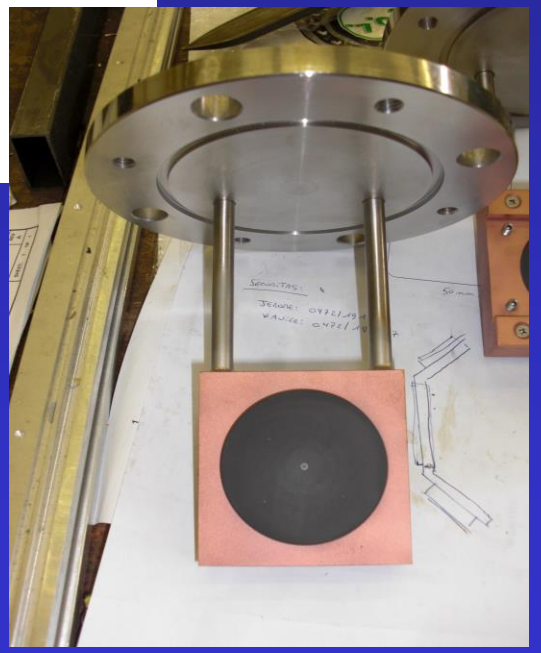




Both the beam dump (FC) and the collimator are cooled with room T water

It can reach 1017 p/cm2 in few hours





AIDA Irradiations 2011-2012: 58 hours

Request Ref.	Beam type	Hours	Irradiation Period
UCL-2011-01	Neutrons	15	September 12th 2011
UCL-2012-01	Protons	9	March 02nd 2012
UCL-2012-02	Neutrons	5	June 4th 2012
UCL-2012-03	Protons	10	June 11th 2012
UCL-2012-04	Neutrons	8	July 7th 2012
UCL-2012-05	Neutrons	11	July 8th 2012

AIDA Irradiations 2013: 40 hours

Request Ref.	Beam type	Hours	Irradiation Period
UCL-2012-06	Neutrons	8	April 29th 2013
UCL-2013-01	Neutrons	24	April 8th – 9th 2013
UCL-2013-02	Neutrons	8	May 8th 2013

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