

Irradiation Facilities at CYCLONE (HIF – LIF – NIF - GIF)

Guy Berger

Université catholique de Louvain
Centre de Ressources du Cyclotron

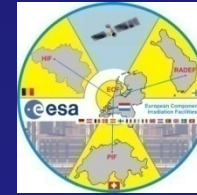


Outline

- ✓ HIF Status
- ✓ LIF Status.
- ✓ GIF Status.
- ✓ Beam Scheduling.



HIF



➤ 2010 Utilization : 1400 h scheduled (59 days).

➤ 2010 Development :

PPAC detectors reliability.

Frame: a new frame system has been designed

UI upgrade: Automatic scan procedure routine for beam
profile control added to the UI.

ECR source: - Final configuration for the source
(frequency/magnetic field) selected.
- Major parts have been ordered.



➤Foreseen Upgrade :

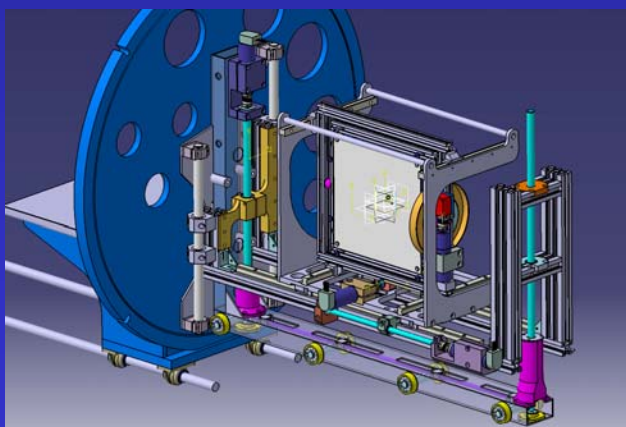
- ECR source: Manufacturing of the permanent magnets and coils.
- Frame: replacement of the existing one by the new one.
- Dosimetry:
 - Set up of a permanent energy spectra measurement system
 - New PPAC design: annular to avoid energy losses of the beam
- Beam diffusion: Study of a magnetic wobbling.

Goal: usable homogenous spot of 4 cm in diameter.

Using the magnetic wobbling and new PPAC will allows to use the cyclotron direct beam.



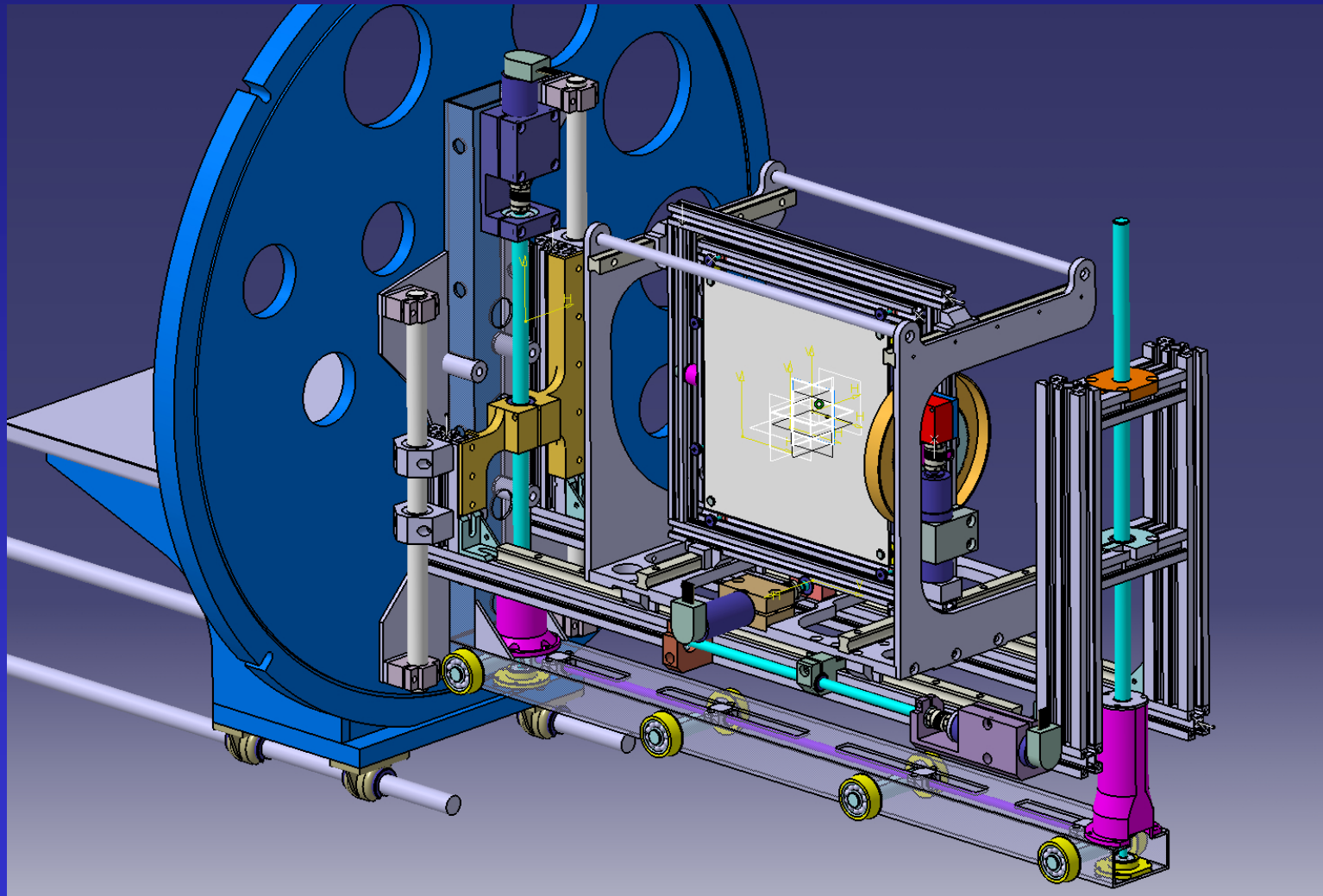
Ion	Energy [MeV]	LET [MeV/mg/cm ²]	Range [microns]
¹³ C ⁺⁴	133	1.2	292
²² Ne ⁺⁷	241	3.2	218
⁴⁰ Ar ⁺¹²	390	10	126
⁵⁸ Ni ⁺¹⁸	603	20	106
⁸³ Kr ⁺²⁵	813	29.7	100



Ion	Energy [MeV]	LET [MeV/mg/cm ²]	Range [microns]
¹⁵ N ⁺³	66	3.2	66
²⁰ Ne ⁺⁴	88	5.75	52
⁴⁰ Ar ⁺⁸	174	14.9	46
⁸⁴ Kr ⁺¹⁷	374	39	46
¹²⁴ Xe ⁺²⁶	548	66.3	44



New Frame





Motor controlled frame using LabView interface



LIF

About 120 h used in 2010

Foreseen upgrades:

- Design of a new beam scan system to check the uniformity.
- Interlock of the ambient air activation detector with the cave access authorization.



GIF

Used 24/7 by two major testing companies

Two UPS have been added at the user station to avoid power failures.

Foreseen upgrades:

- Wall support for low dose rate irradiation (36 Rad/h).
- New room dose rate mapping.
- SMS transmitter in case of failure.



Beam Scheduling

- o HIF : One 5 days period per month (Monday 8 AM to Friday 12 PM).
- o LIF : Two 3 days periods per 6 months.
- o NIF : On request.
- o GIF : All the time.

