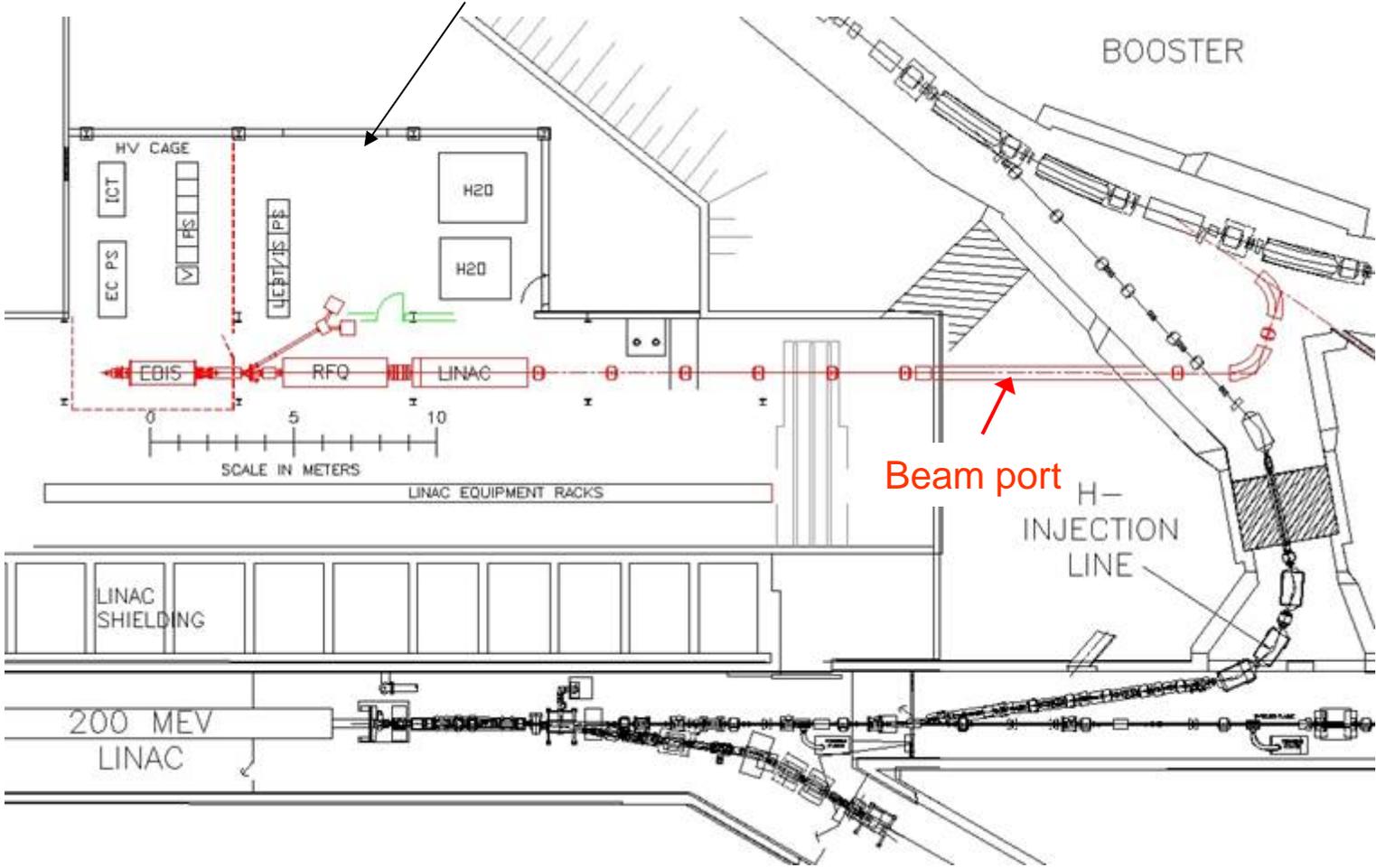
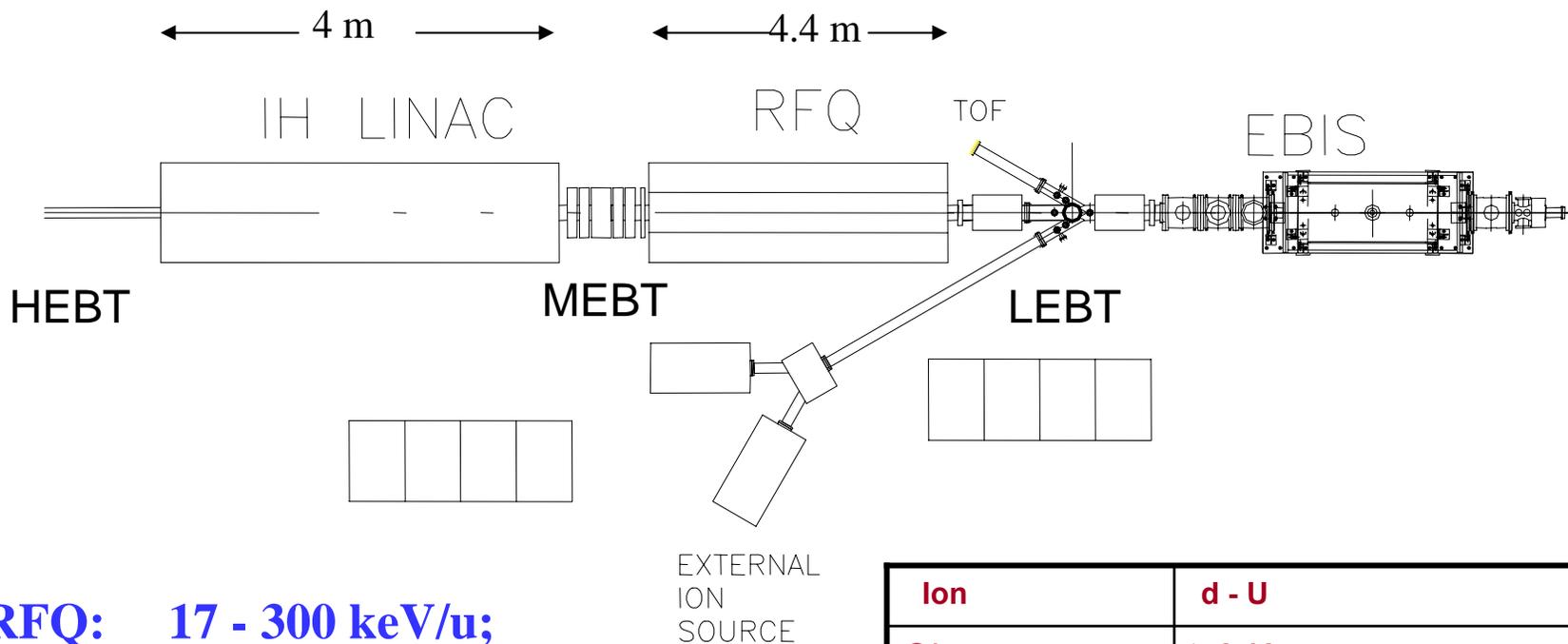


Placement of EBIS Pre-Injector in lower equipment bay of 200 MeV Linac



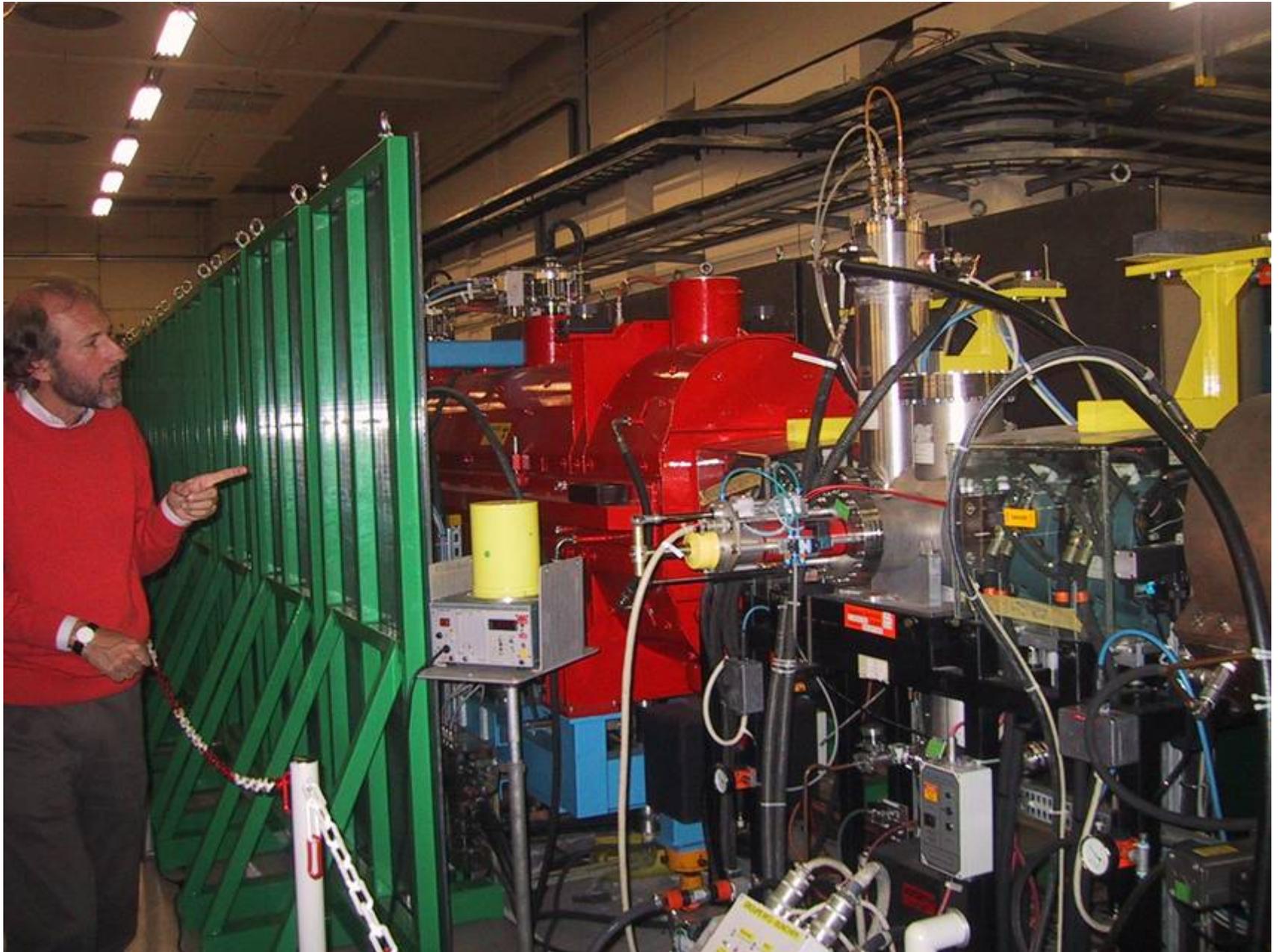
Preinjector Layout

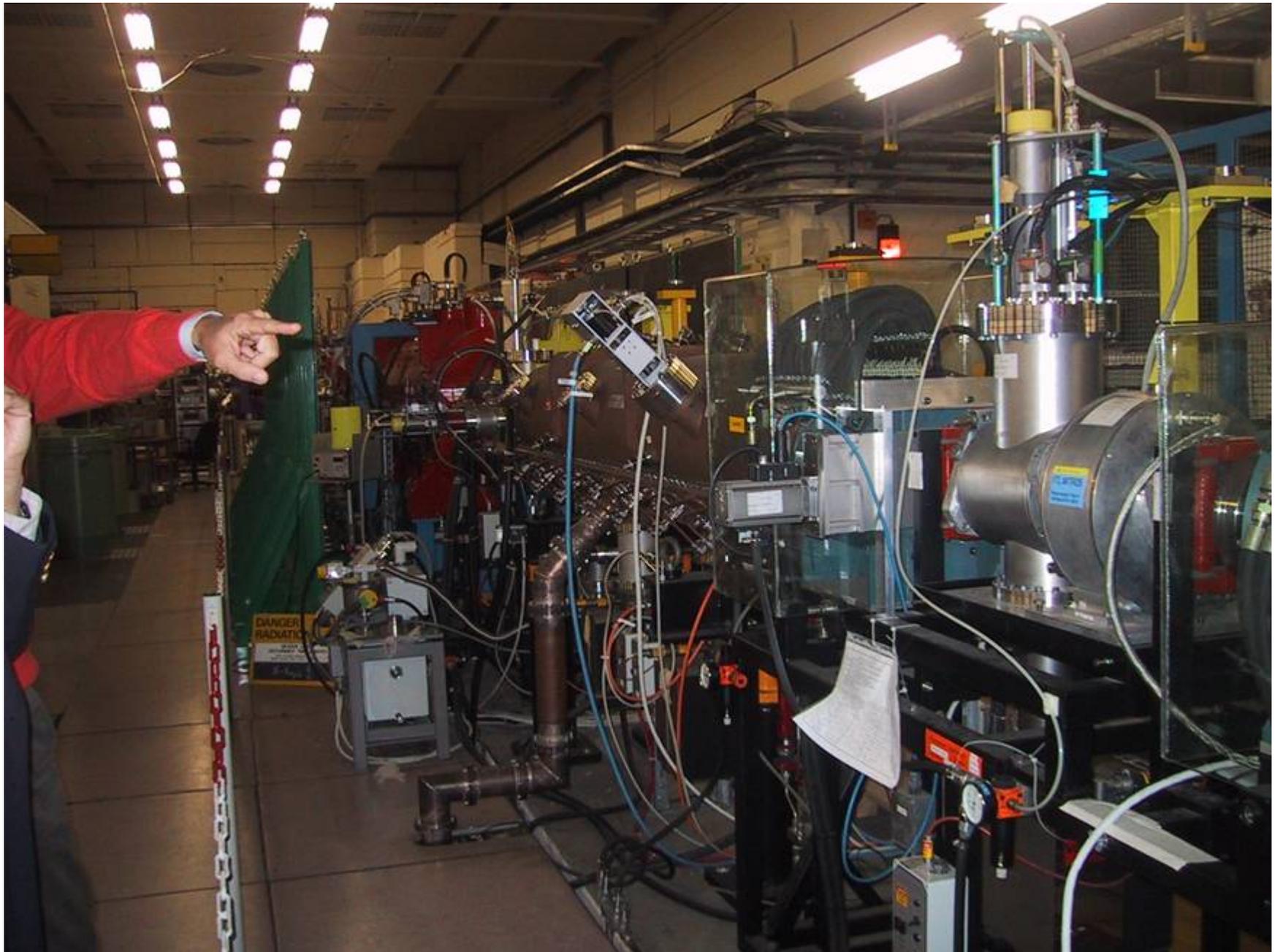


**RFQ: 17 - 300 keV/u;
100 MHz**

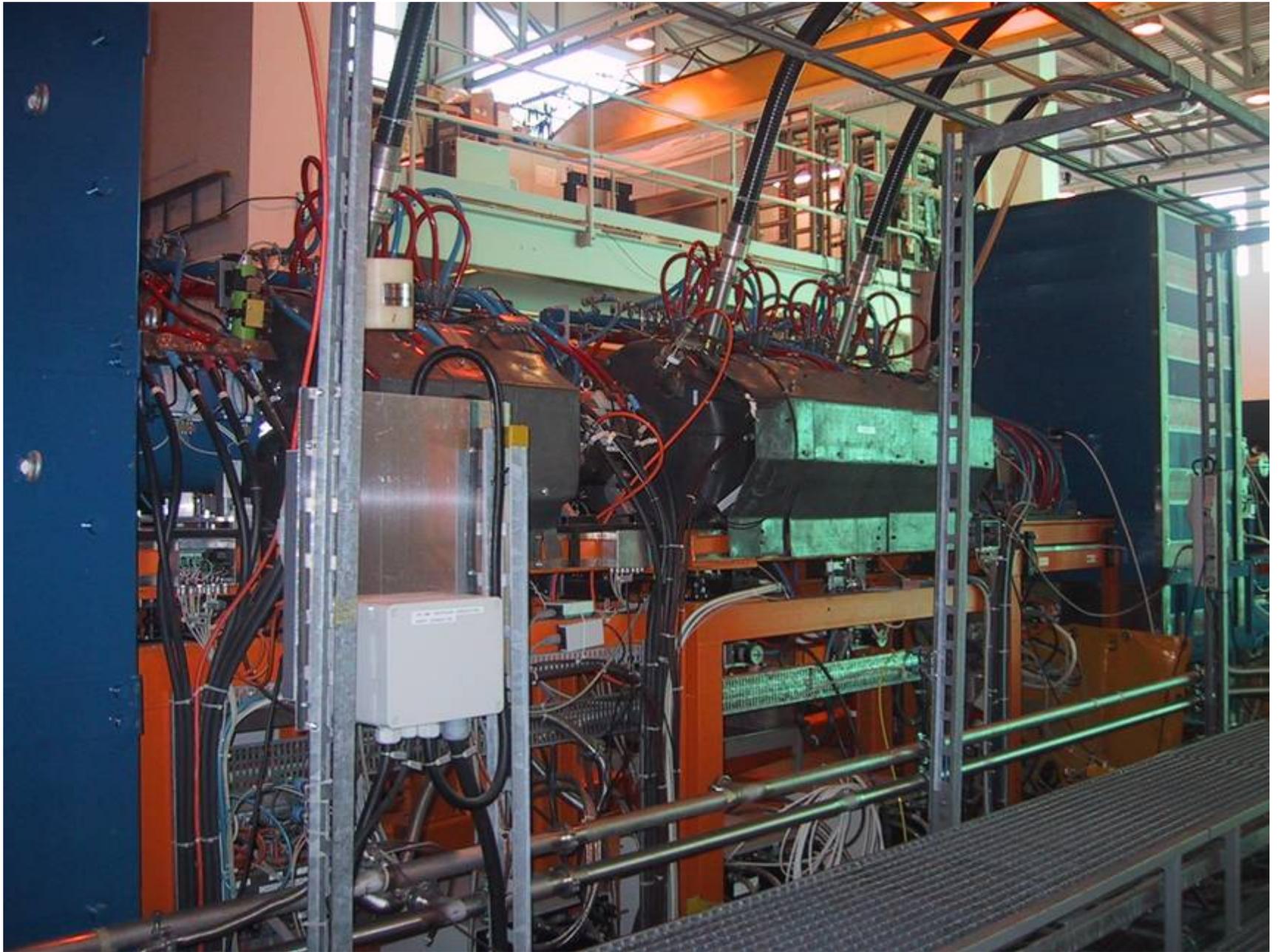
**IH Linac: 0.3 - 2.0 MeV/u;
100 MHz**

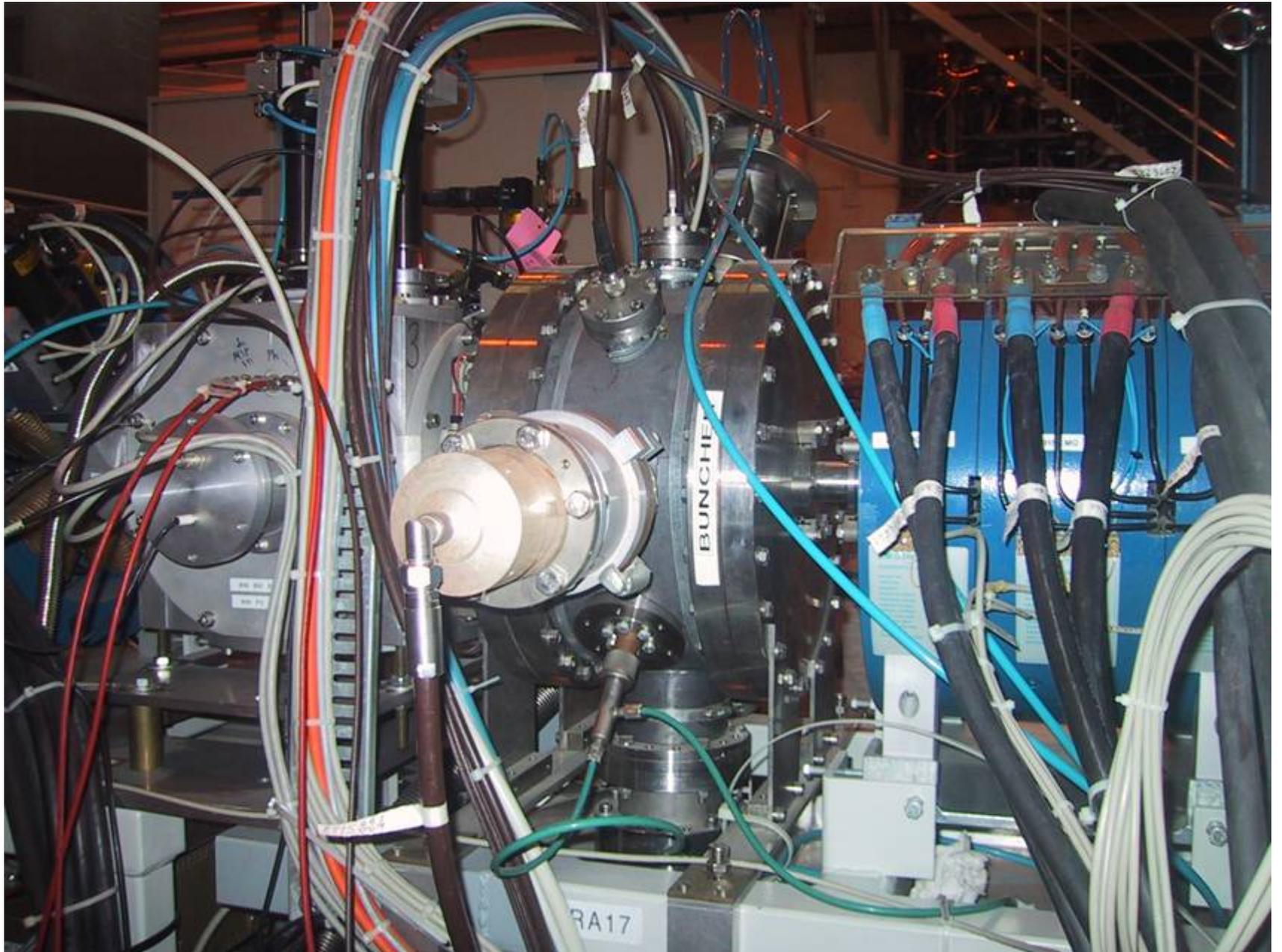
Ion	d - U
Q/m	≥ 0.16
Current	~1.7 emA (for 1 turn inj)
Pulse Length	10 μs
Rep. Rate	5 Hz
Duty Factor	0.005 %















Charles Hill, CERN

My first question is how bad are x-rays coming from the first IH tank.

Could be worse, a measurement on tank 1 recently gave the following values (in microSieverts)

1Hz 10cm average 50

1Hz 10 cm peak 150 (mainly around tuner and RF feeds where they penetrate the shielding)

1Hz 100 cm 10

The radiation scaled linearly with rep rate.

Tank 2 is our main problem with an average of 150 at 10 cm, 40 at 1 meter

Do you have a lead cladding over it?

Yes, 5 mm. Doses were measured outside the cladding.

Do you keep people away from it?

No, but we have a monitor alarm at a hot spot on tank 2

Would it be possible for us (with some lead cladding) to let people work around the cavity while it is running, or do you get too many x-rays from the first tank to work in the area? (if so, what sort of shielding/protection do you have around it?)

The Linac3 building is classed a "simple controlled area" thus work is possible (and is done) by authorised radiation workers carrying film badges.. Areas near the limits are marked. For 5 Hz operation we will probably install 1 cm moveable lead screens.

X-Rays from RF Cavities:

Primarily from Linac and buncher cavities, not from RFQ

CERN Pb Linac:

With 5 mm Pb shielding, which gives ~ factor of 100 reduction:

1 Hz, @ 10 cm, 5 mrem/hr average, 15 mrem/hr peak

1 Hz, @ 1 m, 1 mr/hr

CERN REX-Isolde:

No Pb, 10% duty factor → several hundred mrem/hr
(our duty factor < 0.25%)

They added 6 mm Pb → < 3 mrem/hr at the tank and negligible
at 1m.