Beam studies proposal: Electron Cloud in the IR's

Assumptions compared to the straight sections:

- Bunch charge is double in the IR
- Bunch spacing does not change (216 ns)
- But... SEY changes at each IR

Possible bottle necks will be places with high SEY material: Phobos, Star, Brahms, bi8, yo4, and Phenix.
As far as these locations allow it (Pressure rise, beam lifetime) observations will take place in IR12.

EC instrumentation at IR12

- NEG beam pipe (5 m)
- Solenoids ($\approx$ 10 m)
- Two e- detectors with RFA (1.5m from IR).
- Pressure gauges g11 and g12
- RGA at g12-pwx

Plan

1. Inject 56 bchs in each ring, $N_b \geq 10^9 Au^{79+}$

2. Bring them to collision. If signal is observed in ED:

   a. e- Energy

   b. Vacuum gauges g11 and g12 (NEG test, RGA data)

   c. Solenoid test

3. If no signal observed (noisy detectors), increase bunch number (56, 68...) without machine damaging

IR materials length

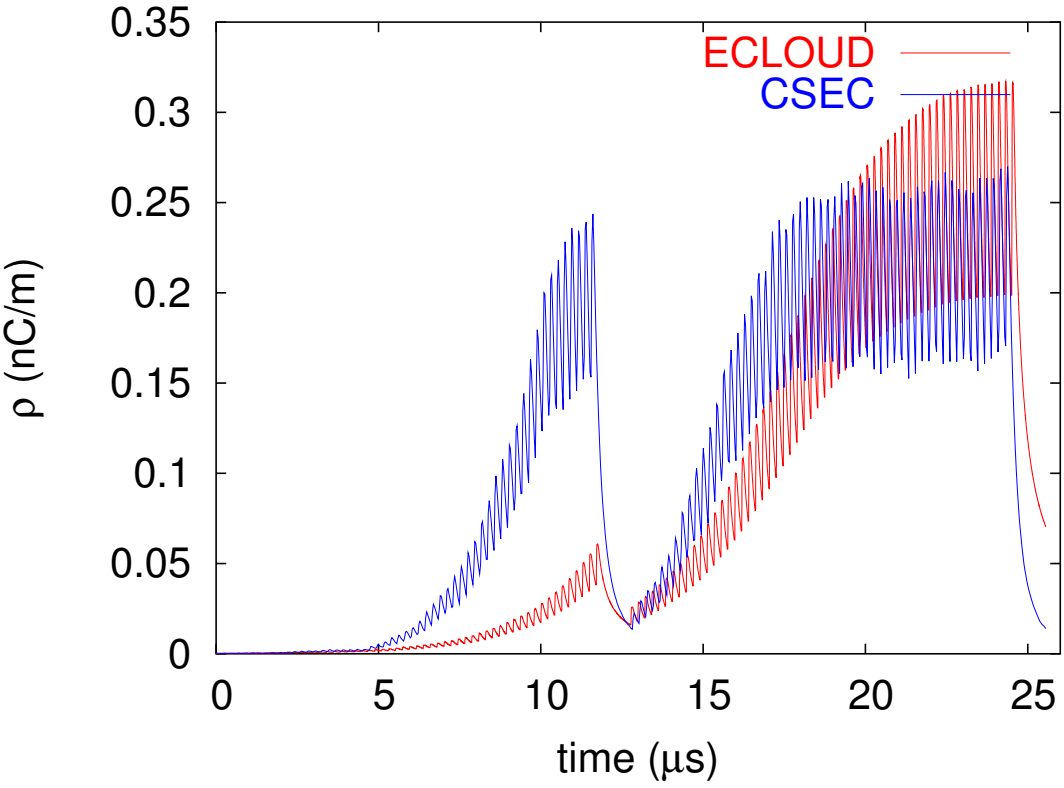
name	Be	Al	StSt	NEG
Brahms	1.5m	5.6m	10.1m	-
Star	1.5m	6.6m	9.1m	-
Phenix	1.5m	-	15.7m	-
Phobos	12m	-	5.2m	-
IR12	-	-	12m	5.2m

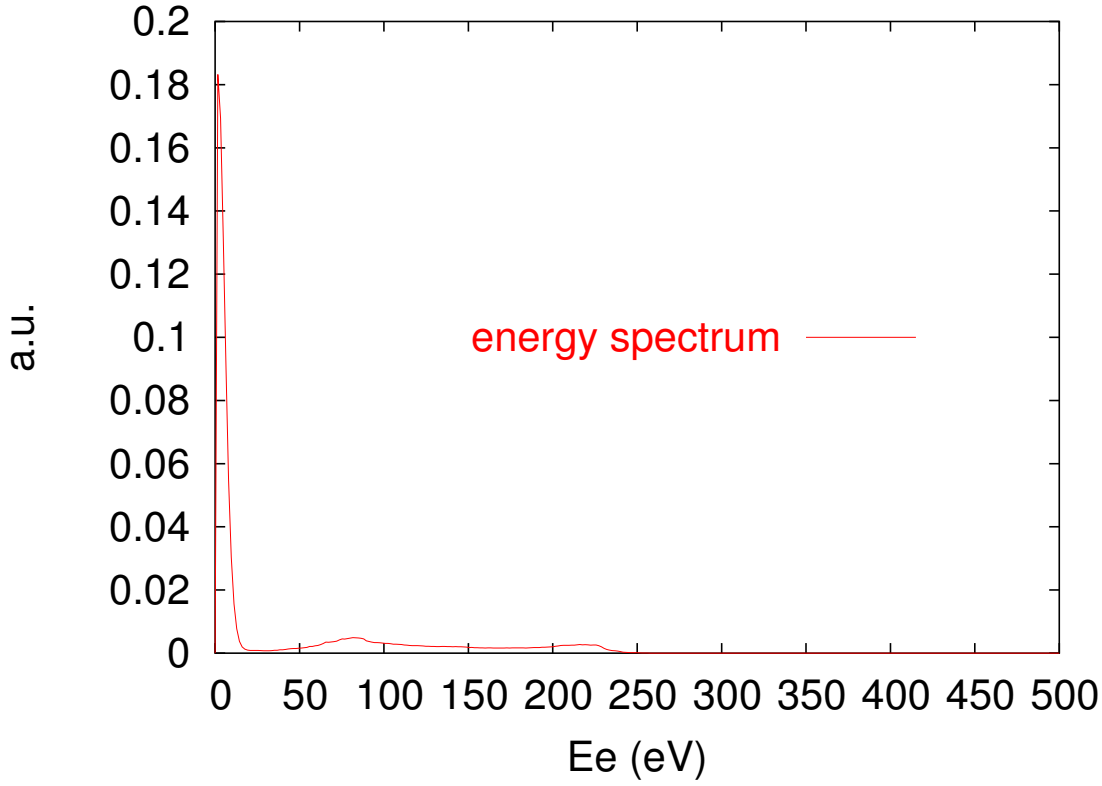
IR bunch charge thresholds (N_b) per beam for 55 bunches.

material	SEY	E_{max} (eV)	N_b **(**Au^{79+}**)**
St St	1.9	310	$\approx 1 \times 10^9$
Al	2.3	300	$\approx 6 \times 10^8$
Be	2.8	250	$\approx 4 \times 10^8$

In the straight sections, pressure rise due to electron cloud is expected only at bi8 and yo4 (not significant).

Some predictions

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0.18
0.16
0.14
0.12
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a.u.
energy spectrum
0
50
100
150
200
250
300
350
400
450
500
Ee (eV)