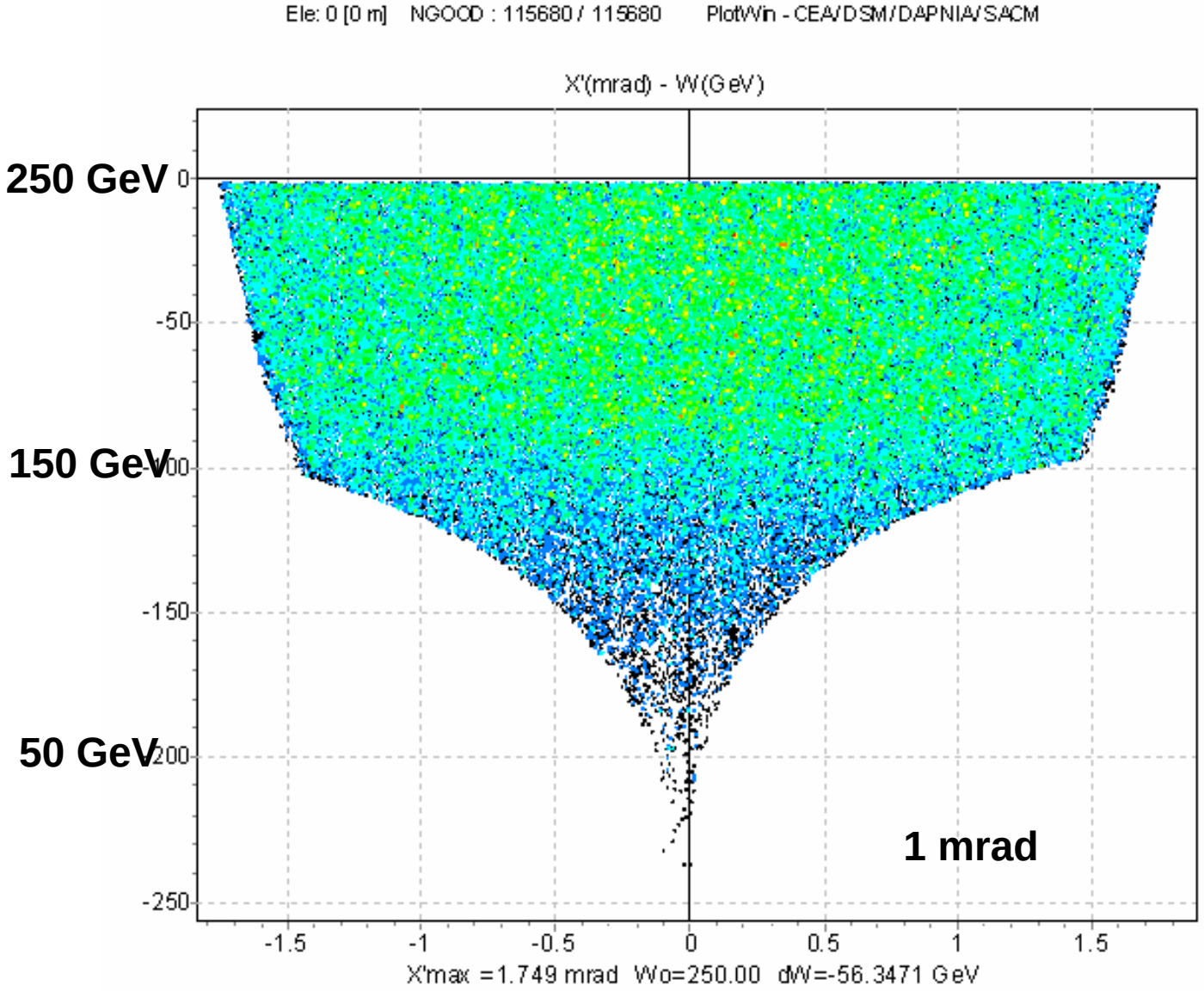
Beam losses on the Separators

O. Dadoun, D. Uriot, O. Napoly

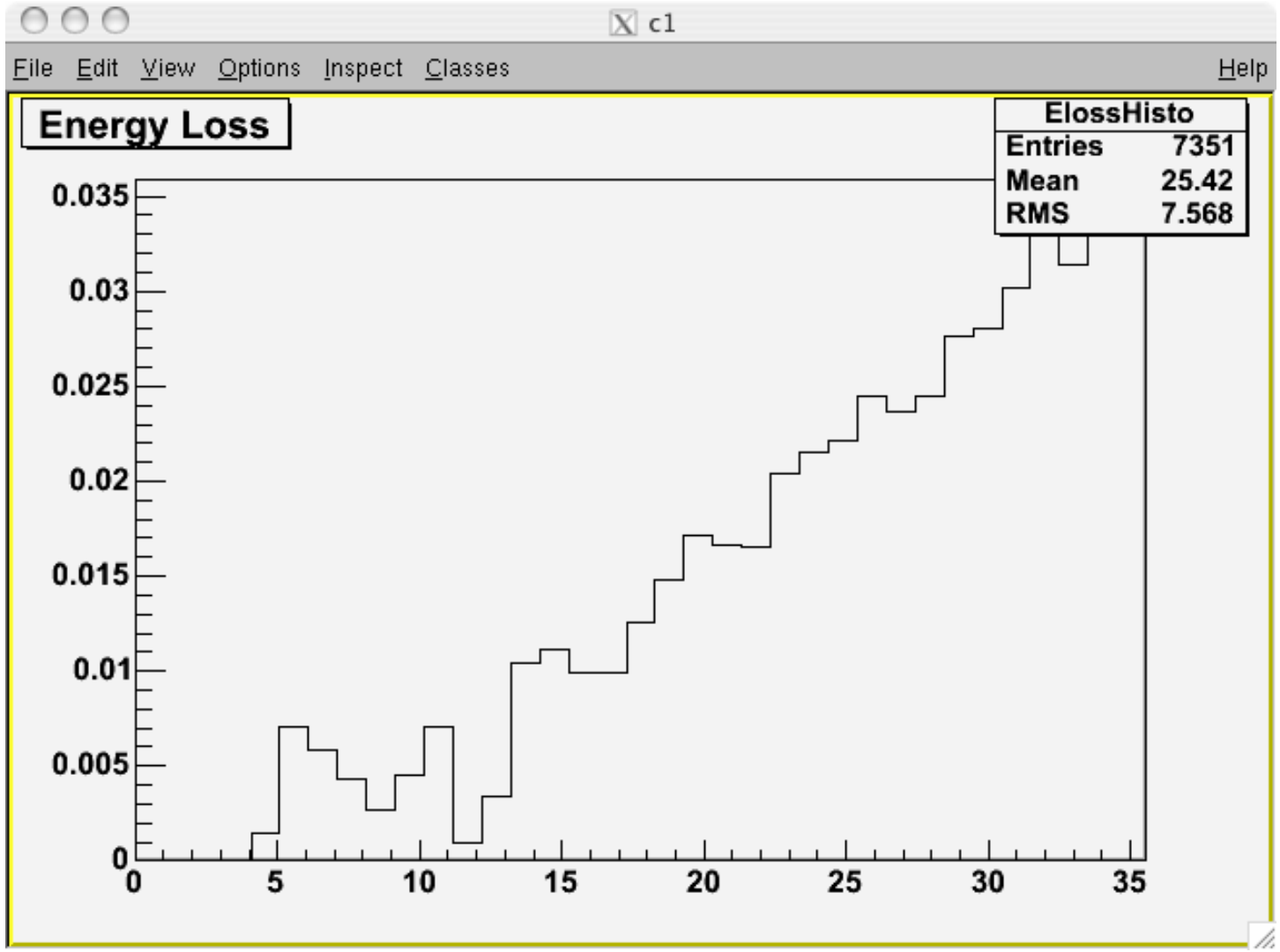
Basic assumption and goals

- Check the spent beam and rad^{ive} Bhabhas losses on the separator plates : relative importance and absolute power levels
- Benchmarks 3 codes : BDSIM (Dadoun), Tracewin (Uriot) and LUMON (Napoly)
- 250 GeV head-on optics from February used: obsolete, for the sake of comparison
- Separator : 25 m, 5 mrad, treated as a dipole, round aperture of 10 cm diameter, for the sake of comparison.
- ILC500 nominal parameters

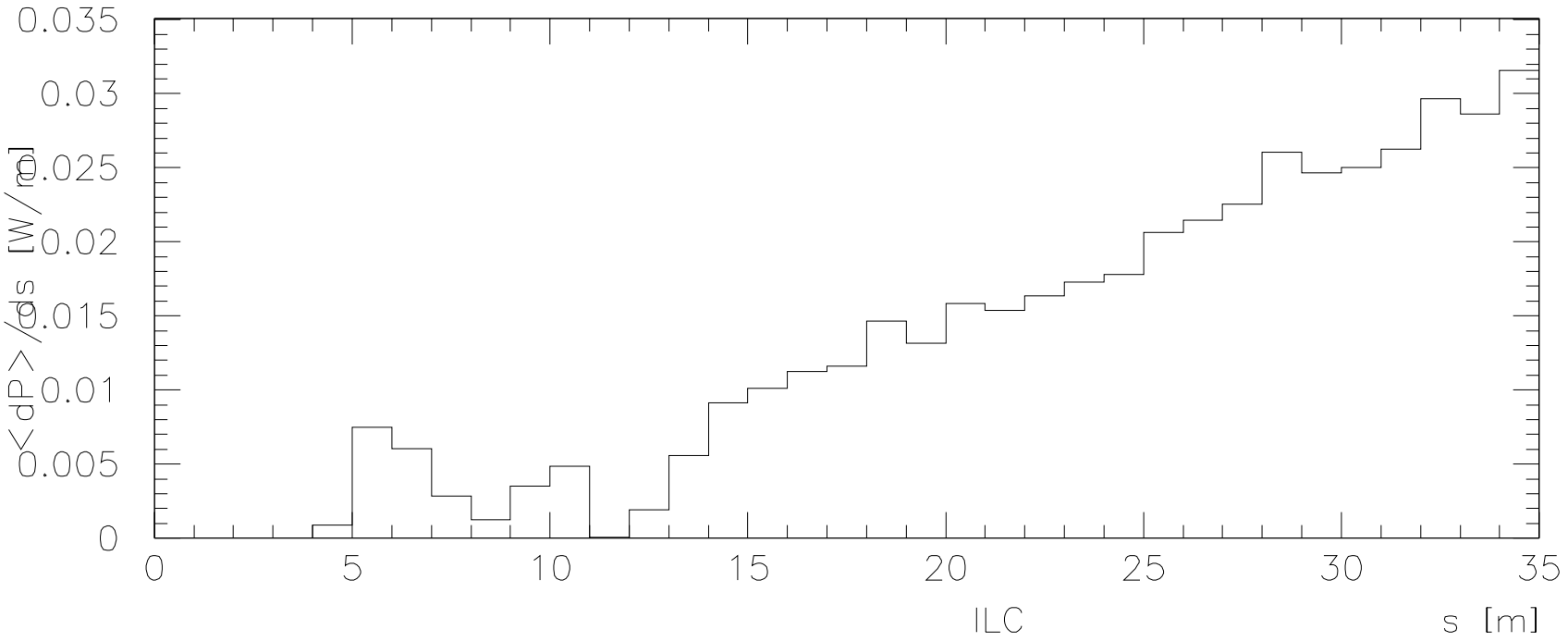
Acceptance of the Beam Line down to Separator Exit (solenoid ON)



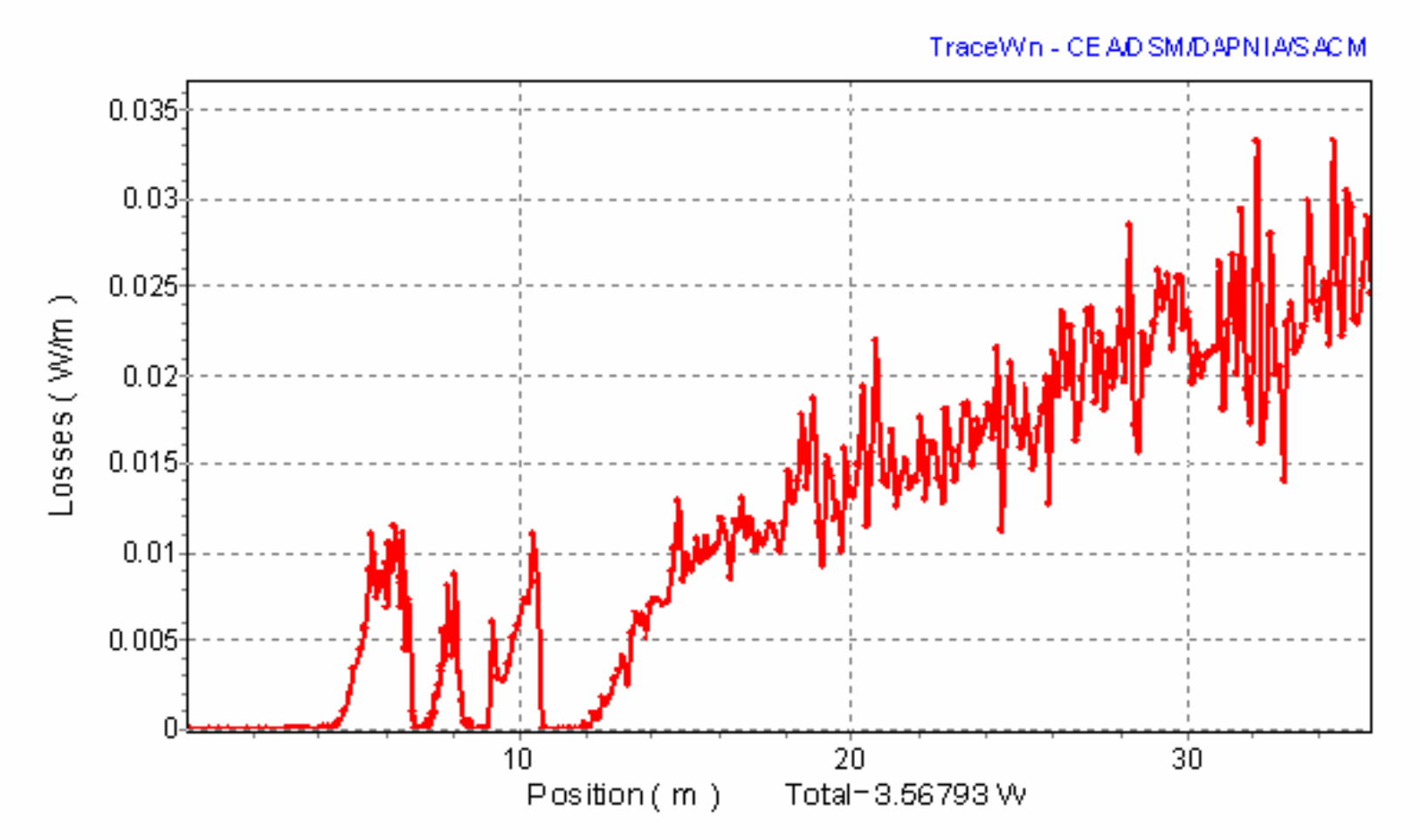
Radiative Bhabhas Losses from BDSIM



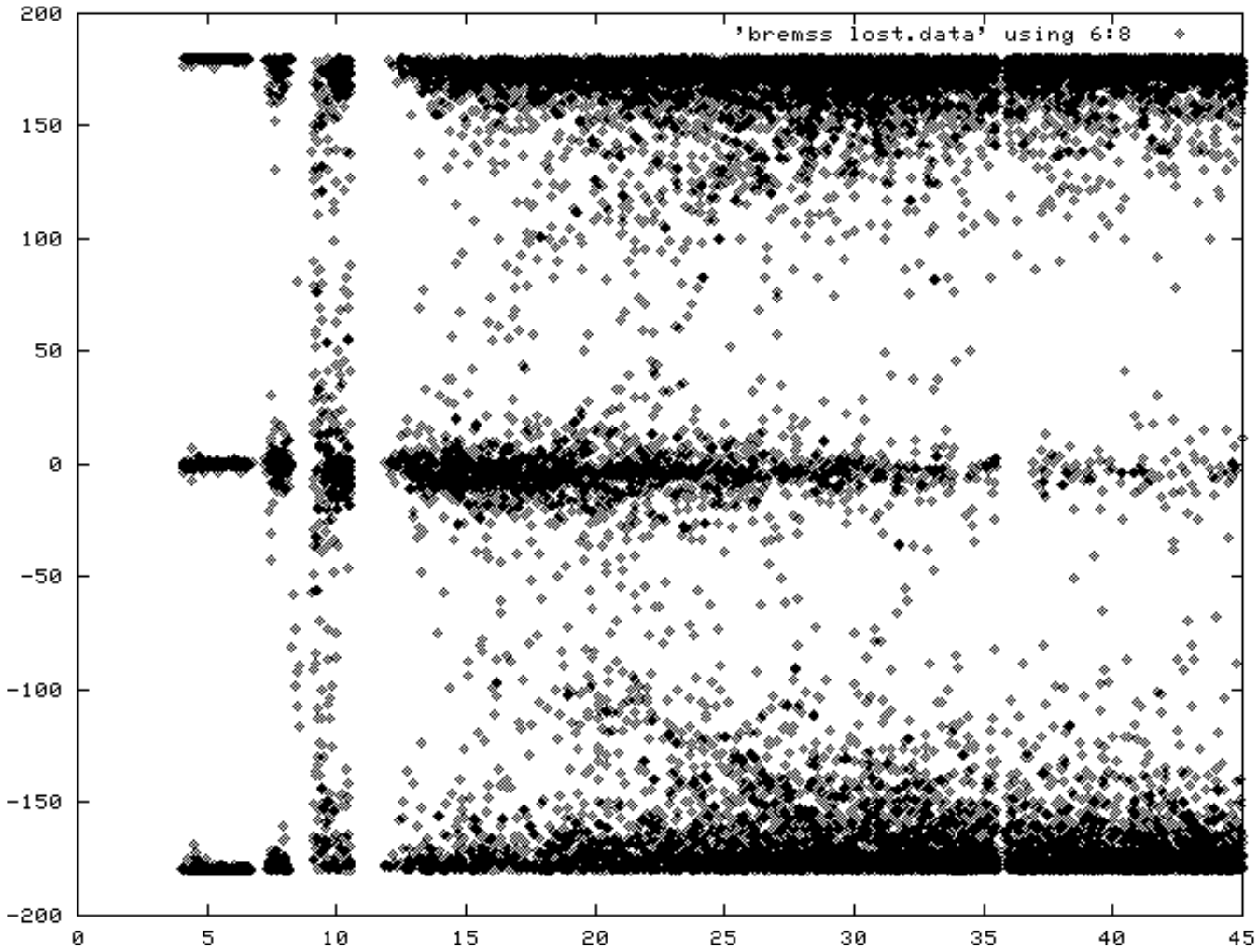
Radiative Bhabhas Losses from LUMON (sextupoles off)



Radiative Bhabhas Losses from LUMON (sextupole OFF)



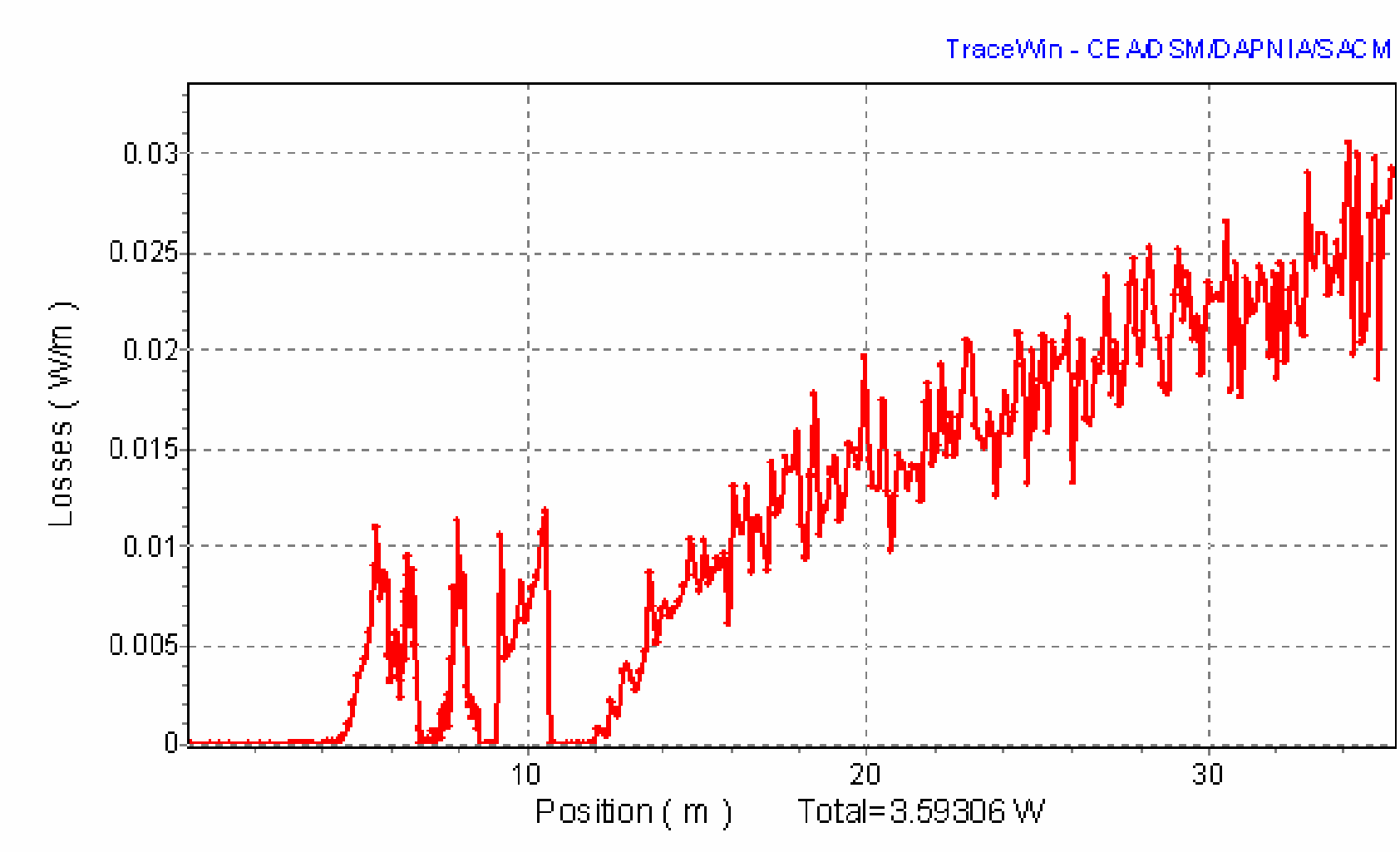
Radiative Bhabhas Losses Topology (LUMON, Sext OFF)



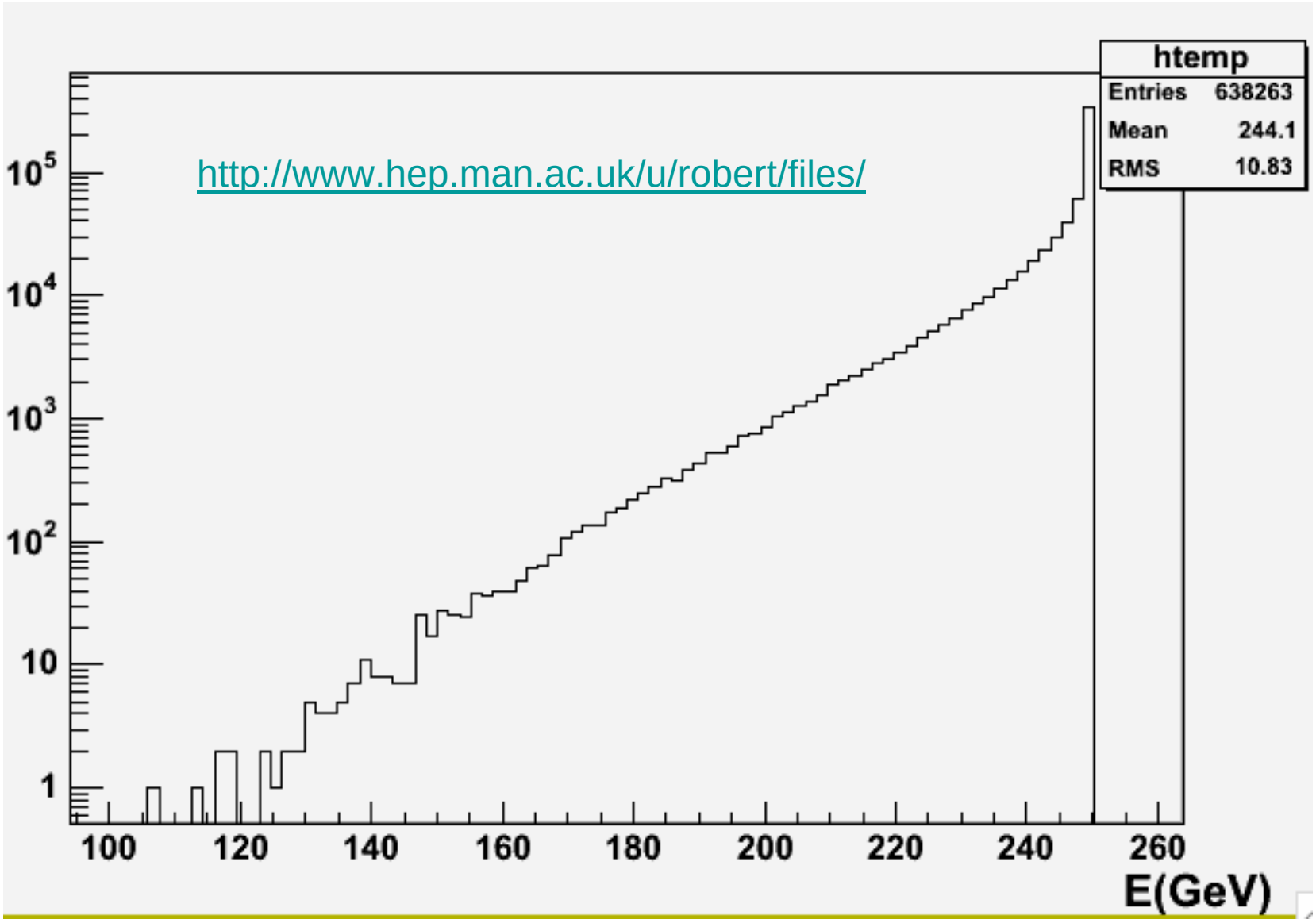
Radiative Bhabhas Losses from TRACEWIN (sextupole ON)

	Energy (GeV)	(W)	Particules
QD0	3364.88	3.80E-03	1951.00
D1	3086.99	3.48E-03	109.00
SD0	3696.02	4.17E-03	213.00
D2	1350.25	1.52E-03	4.00
QF1A	817.07	9.22E-04	30.00
D3	22.69	2.56E-05	79.00
SF1	684.93	7.73E-04	415.00
D5	10518.20	1.19E-02	50.00
SEPA	108525.06	1.22E-01	4432.00
SEPB	235176.26	2.65E-01	5791.00

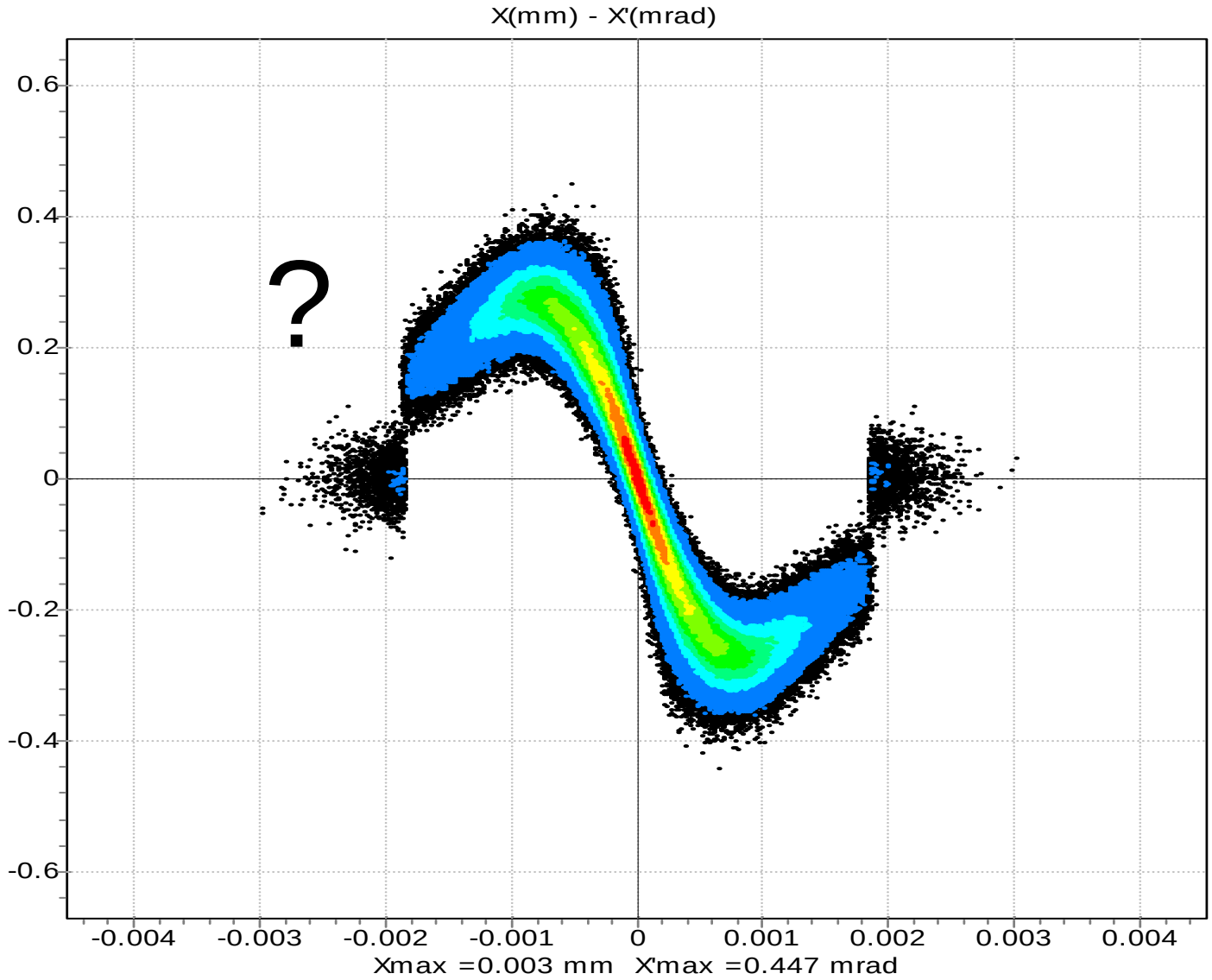
Radiative Bhabhas Losses from TRACEWIN (sextupole ON)



Spent beam: energy spectrum



Spent beam: horizontal phase space



Spent beam losses

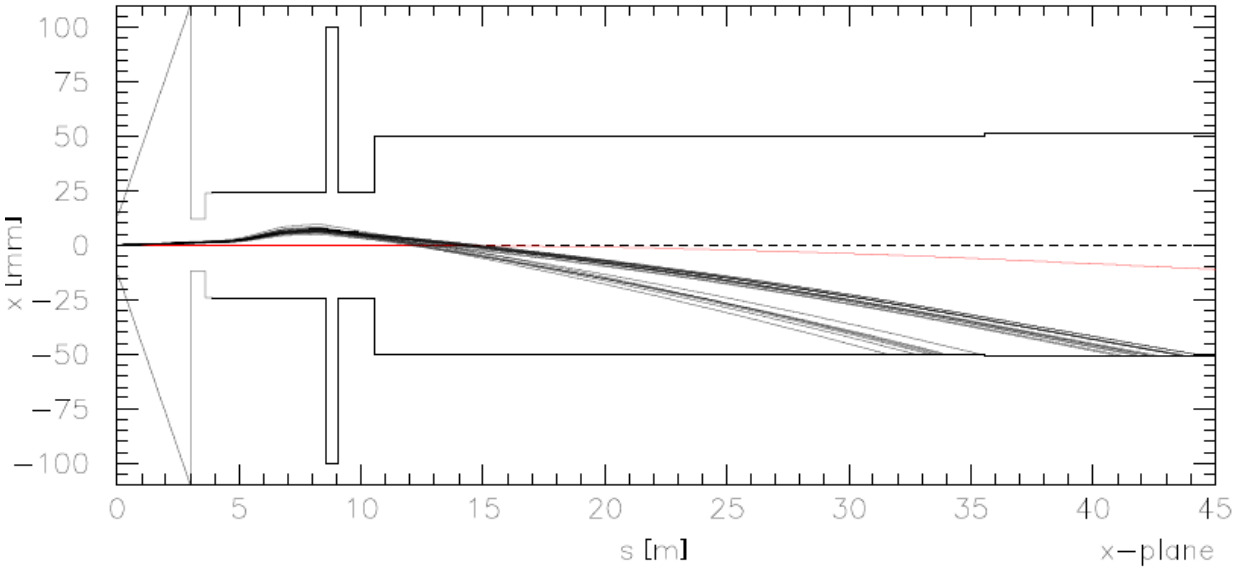
- No losses recorded from Rob's 1.3MParticules distribution.
- Losses obtained with tail1+2 distribution from Andrei's web site:

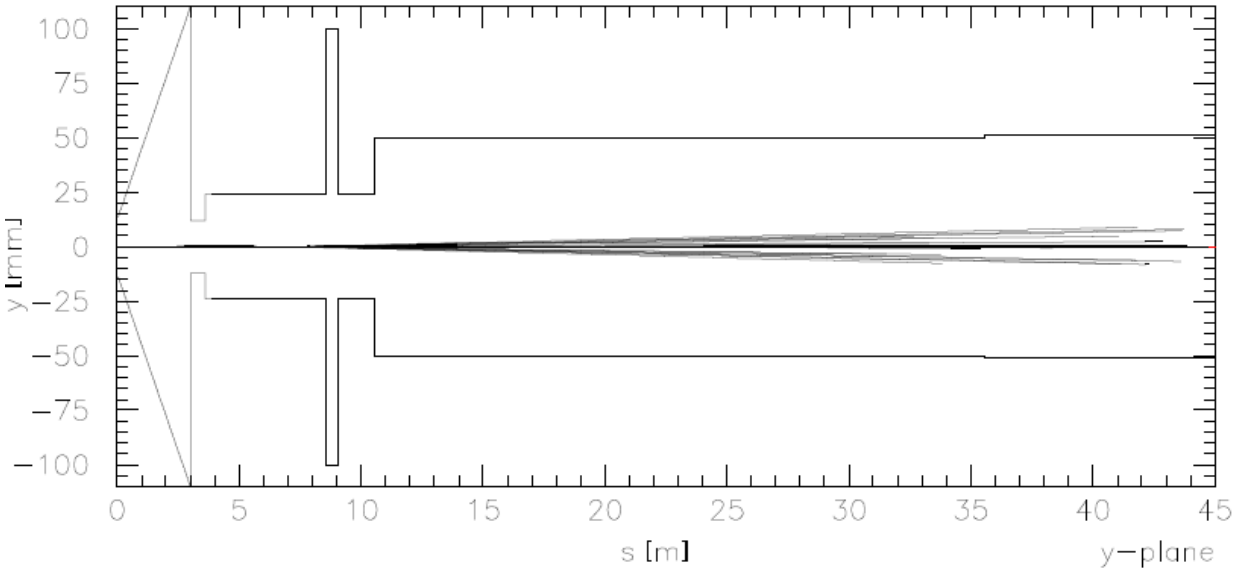
  7 particles lost at the separator end: ~1/2 W

Spent beam losses

7 particles lost at the separator end:

~1/2 W





Next Steps

- Use the latest doublet from Payet’s FFS
- Use rectangular aperture of Separator
- Refine the statistics for spent beam
- Obtain limits of losses on separator plates
- Produce tracking results