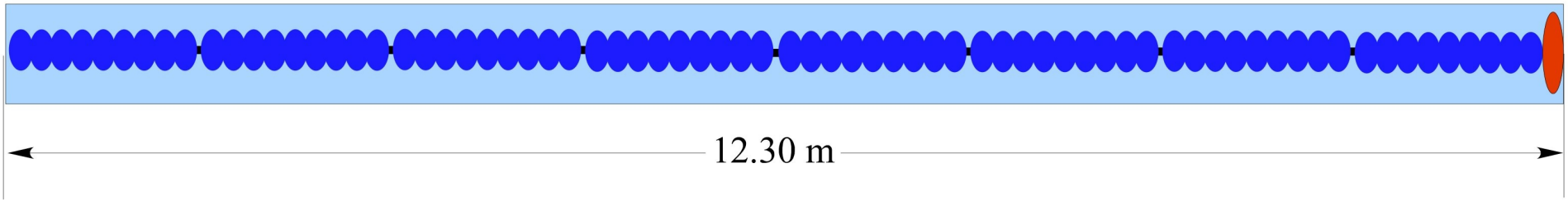
Cost Estimation of Conventional scheme

- Cost estimation was made based on BCD/RDR numbers.
  - Subtract Undulator tunnel, undulator related hardware, positron transport line(from e- side to e+ side), etc.
  - Additional TBM tunnel to accommodate the e- driver (400m).
  - Less TBM tunnel (300m) because the e+ booster share the BDS tunnel.
  - Single target system; The cost is assumed to be identical to that for undulator.
  - Single e- Gun : Laser RF Gun is assumed, but the cost is identical to that for KAS (DC photo-cathode).

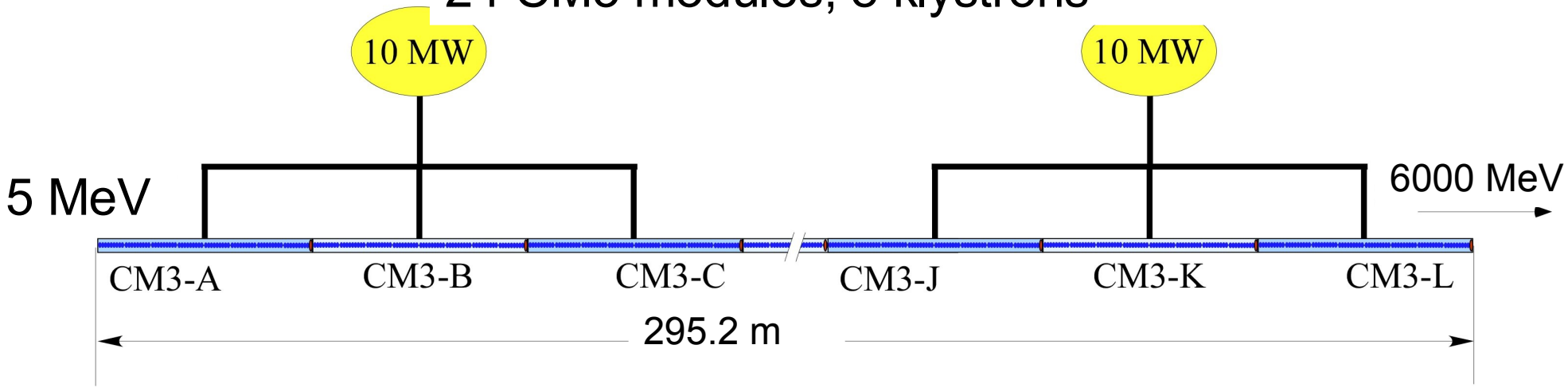
e- driver configuration

- RF photo-injector instead of DC photo-cathode.
  - An additional NC RF source
- Omit two SHBs.
- SC booster instead of NC booster. (In BCD/RDR, NC booster is assumed)
  - Additional RF and CM for e- driver (500MeV –> 6 GeV). 24 Cryomodule driven by 7 klystrons (7 RF Units)
- Cost of AC power, Magnets, Beam instrumentation is scaled as fraction of this new configuration w.r.t BCD/RDR number.
- We might need a BC section, which causes additional cost.

CM3 SC Accelerator Module for e- Booster

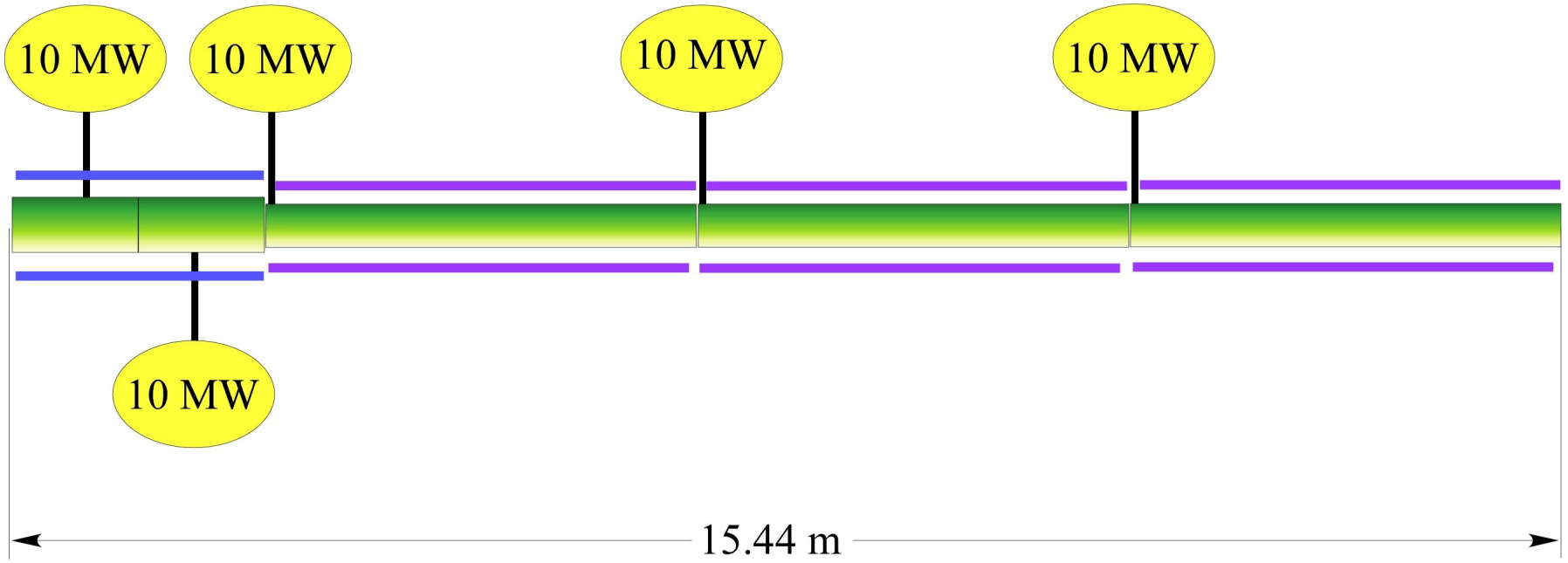


Proposed EBSTRT: 4 MeV to 5000 MeV
24 CM3 modules, 8 klystrons



NC Positron Capture Accelerator System

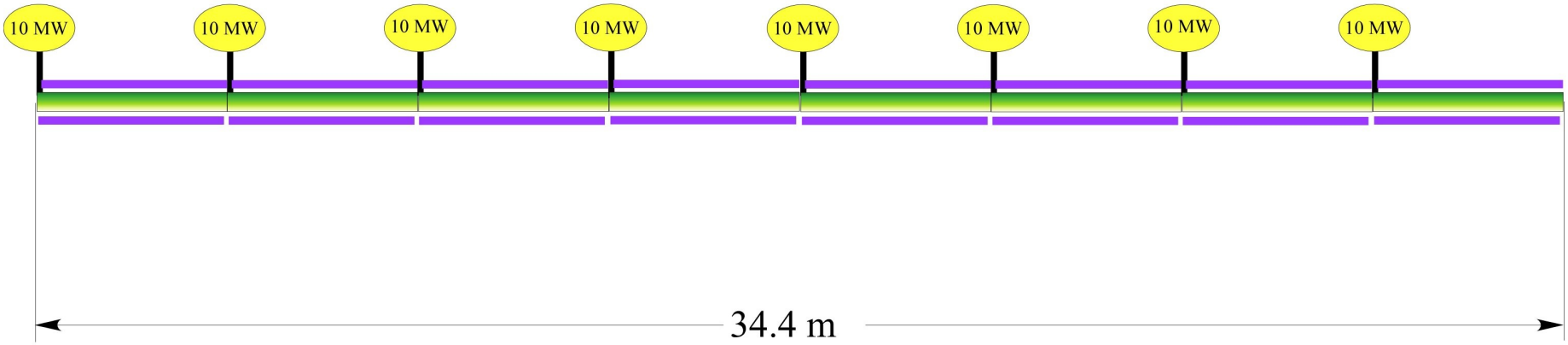
0-125 MeV



2 x 1.27 m SW Section
3 x 4.3 m TW Section
5 x 10 MW Klystron
2 x 1.27 m 0.5T Solenoid
3 x 4.3 m 0.5 T Solenoid
(from J. Wang)

NC Positron Pre-Accelerator System

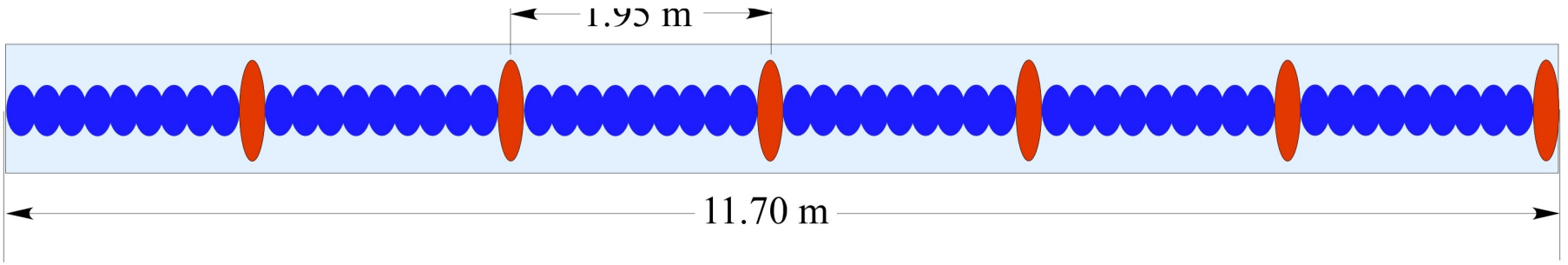
125-400MeV



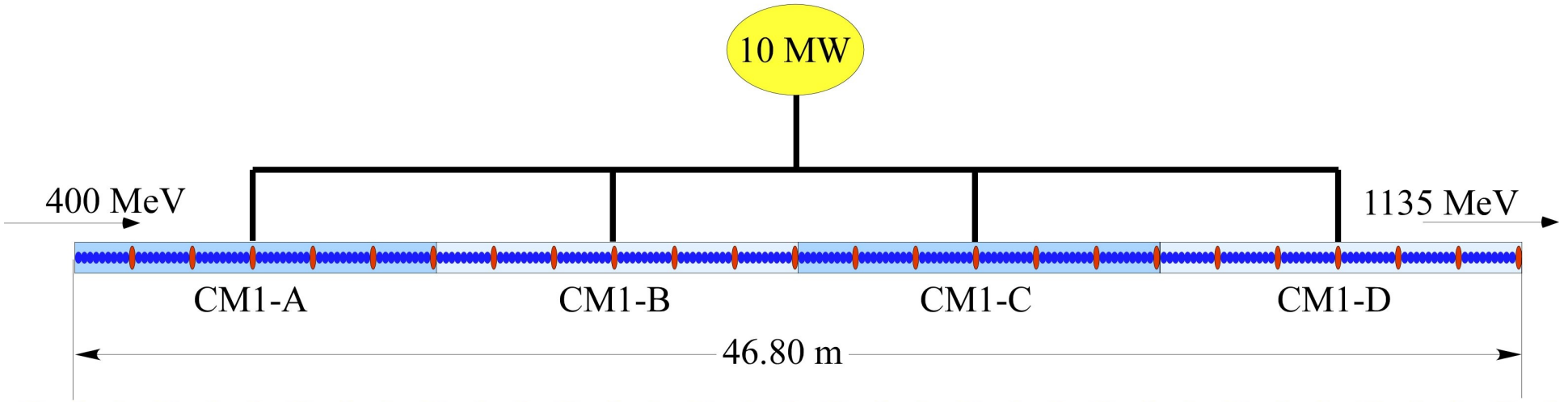
8 x 4.3 m TW Section
8 x 10 MW Klystron
8 x 4.3 m 0.5 T Solenoid
(from J. Wang)

CM1 SC Accelerator Module

for e+ Booster

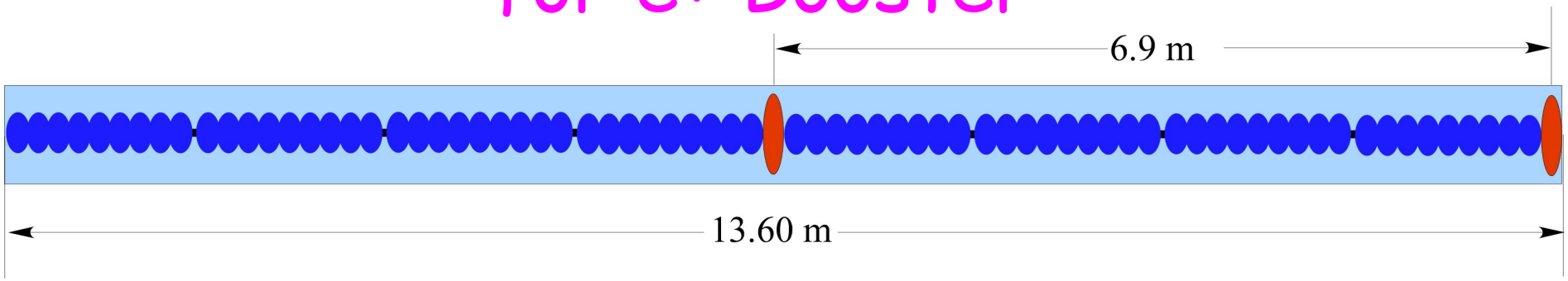


Proposed PBSTR-1: 400-1135 MeV

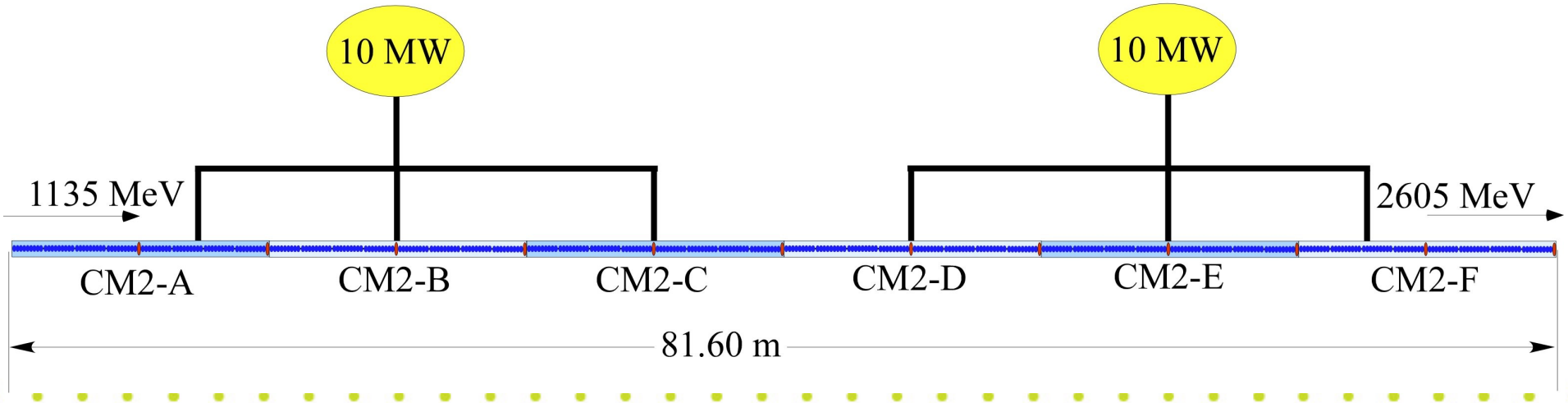


CM2 SC Accelerator Module

for e+ Booster

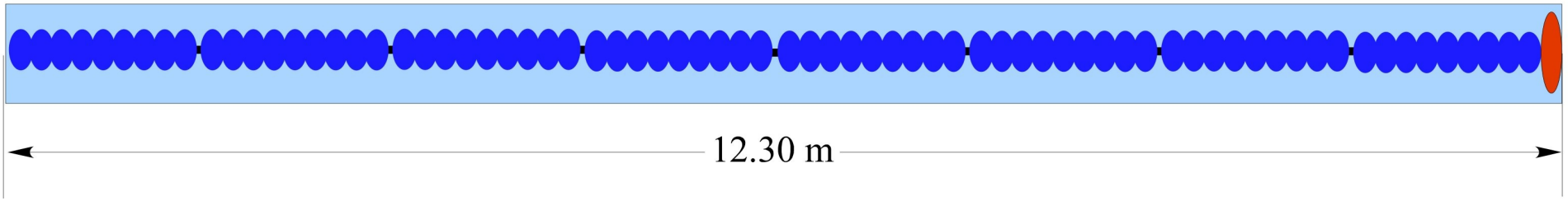


Proposed PBSTR-2: 1135-2605 MeV

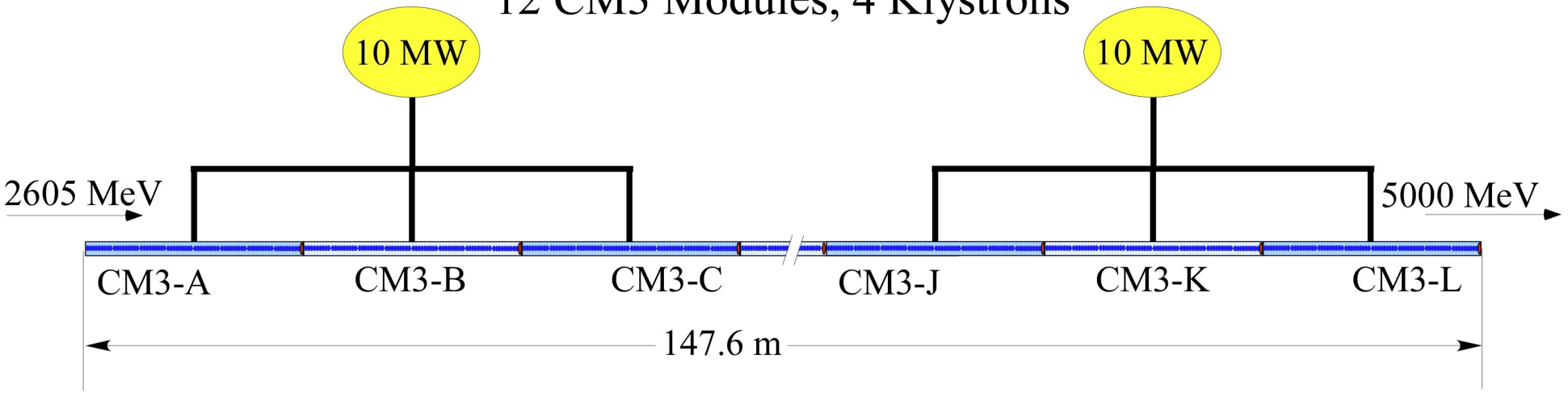


CM3 SC Accelerator Module

for e+ Booster



Proposed PBSTR-3: 2605-5000 MeV
12 CM3 Modules, 4 Klystrons



Fraction

	AC Power	N Quads	N Bends	N Corr	N BPM
TAPA	416	13	0	13	13
PCAP	14.3	0	2	0	0
PPA	900	0	0	0	0
PPATEL	15	10	4	10	10
PBSTR	799	90	0	90	90
KAS(EDRV)	899	90	2	90	90
LTR	118	100	8	100	100
RDR Sum	13069.5	8365	138	13069.5	8365
Fraction	0.24	0.04	0.12	0.02	0.04

Cost Estimation of Conventional

- The accuracy is limited because I do not have any detail information on inventory for any technical systems (e.g. Vacuum). Just rough scaling is applied.
- Comparing to BCD/RDR undulator, the cost for the conventional according to the estimation, is almost 1/2.