Linac in Booster Tunnel

Milorad Popovic
http://www-bdnew.fnal.gov/proton_source/popovic/index.html

Booster-Linac Upgrade
Fermilab, 29-March-2001

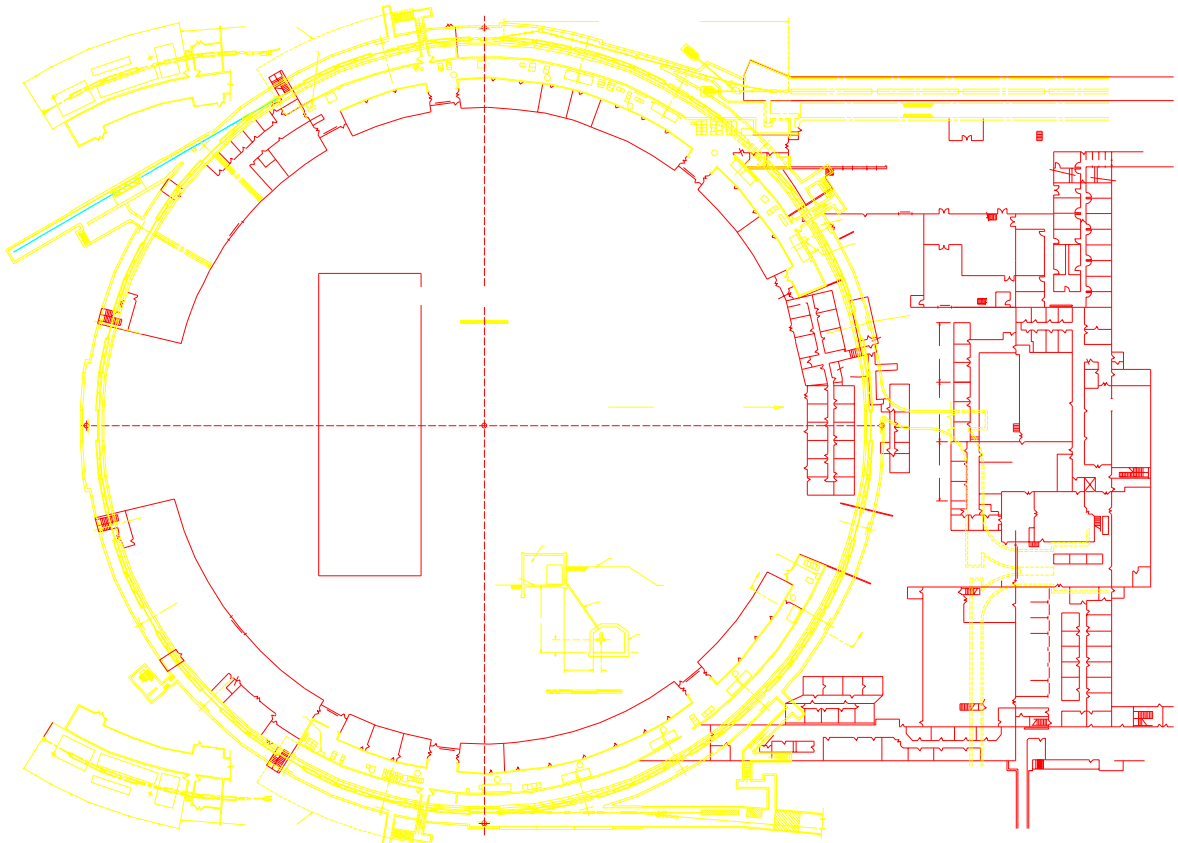
Linac Booster Complex

Linac-Booster-Lessons from Past

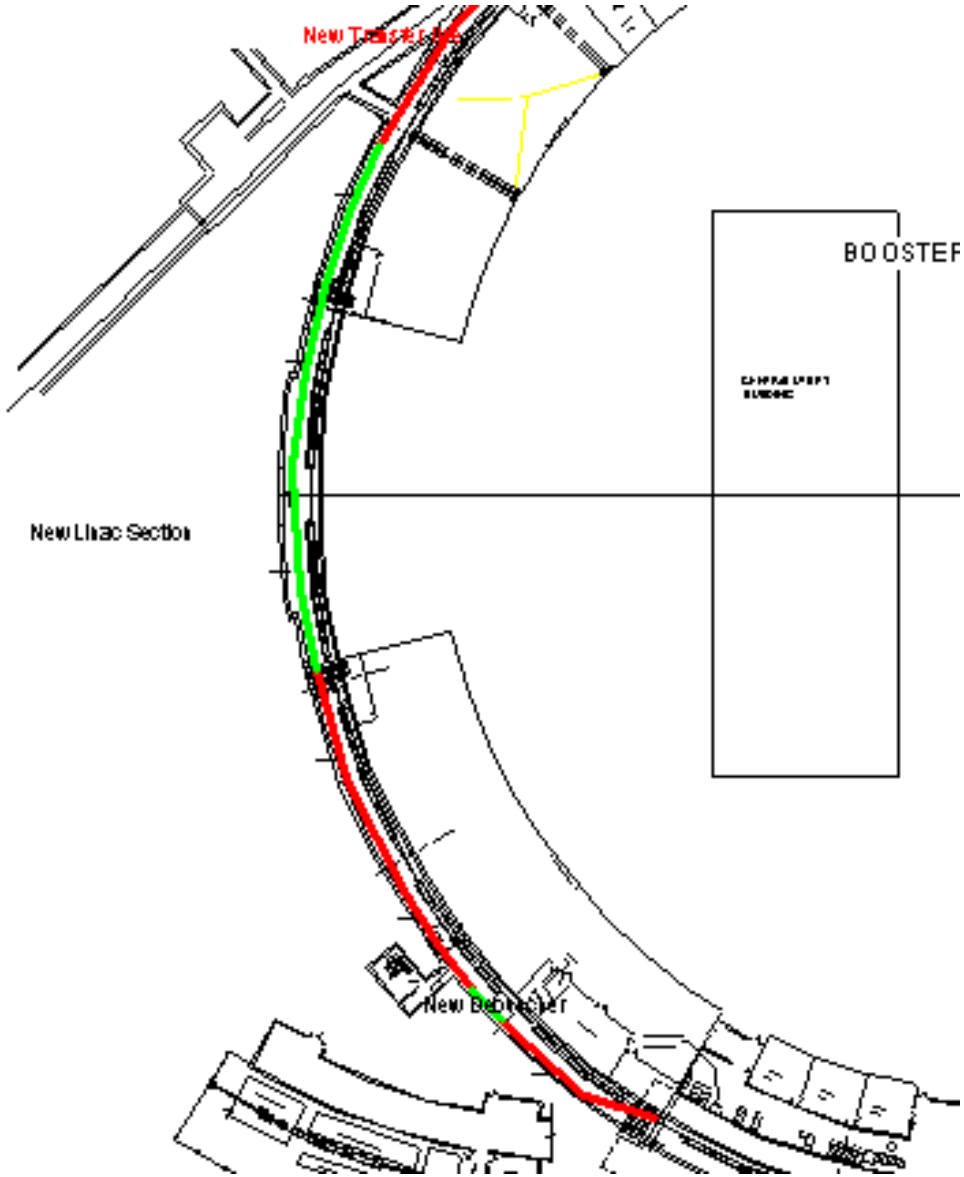
- Technology- Copy of Linac 93 Upgrade
- Risk – Curved Linac
- Cost – 20MeV/1M$ in ’93 -> Today 20MeV/1.5M$
- Civil Construction – Almost None
- Duration of Construction – 1.5 to 2 Years
- Staging & Impact on Scheduled Operations

a. One Shutdown for two months -> injection & penetrations
b. Several Shutdowns for two weeks or less -> modules
c. In 91-93, two one month, and one(final) 3 months.

Booster Ring Drawing

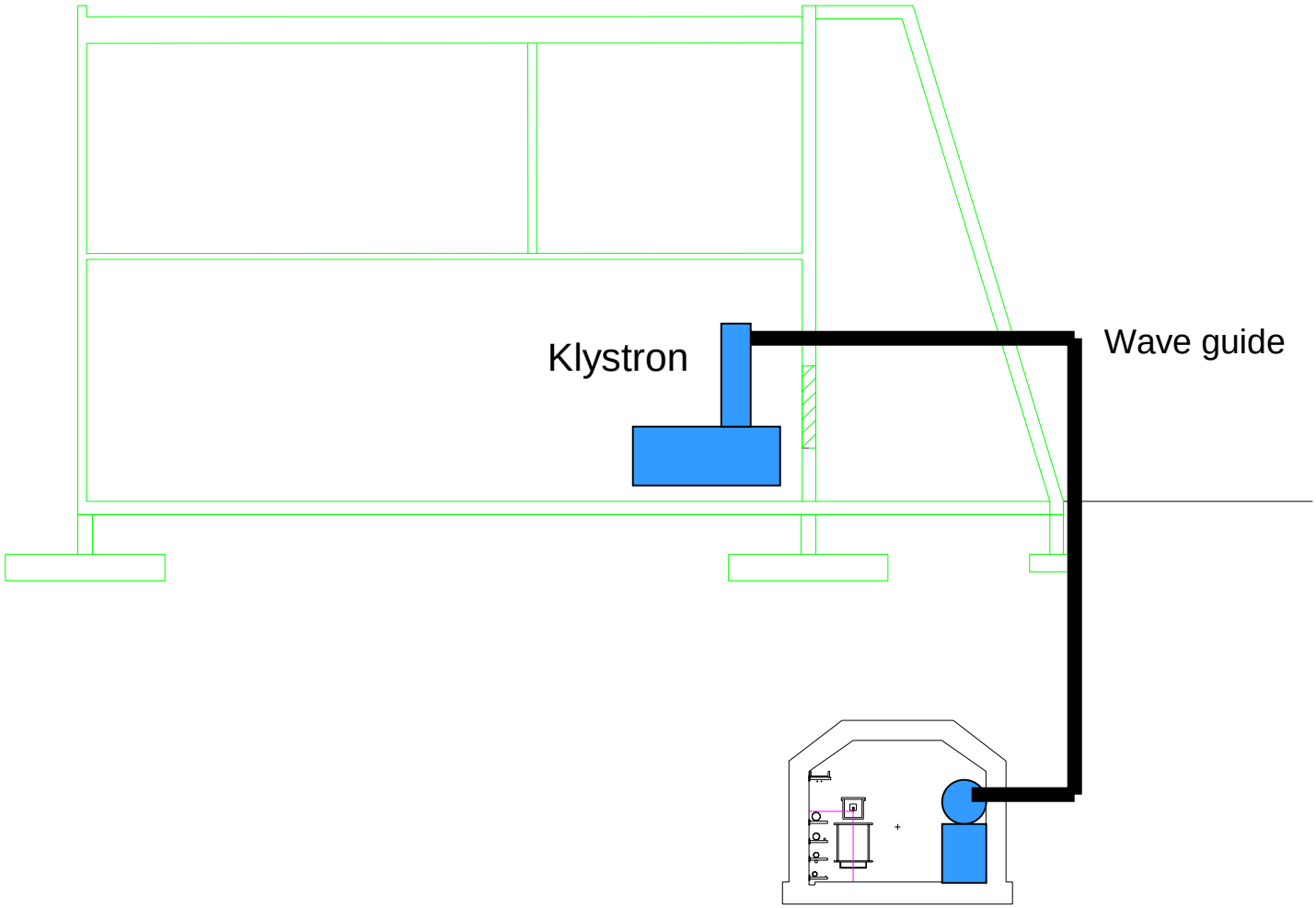


Booster Ring Drawing



Booster East Tower

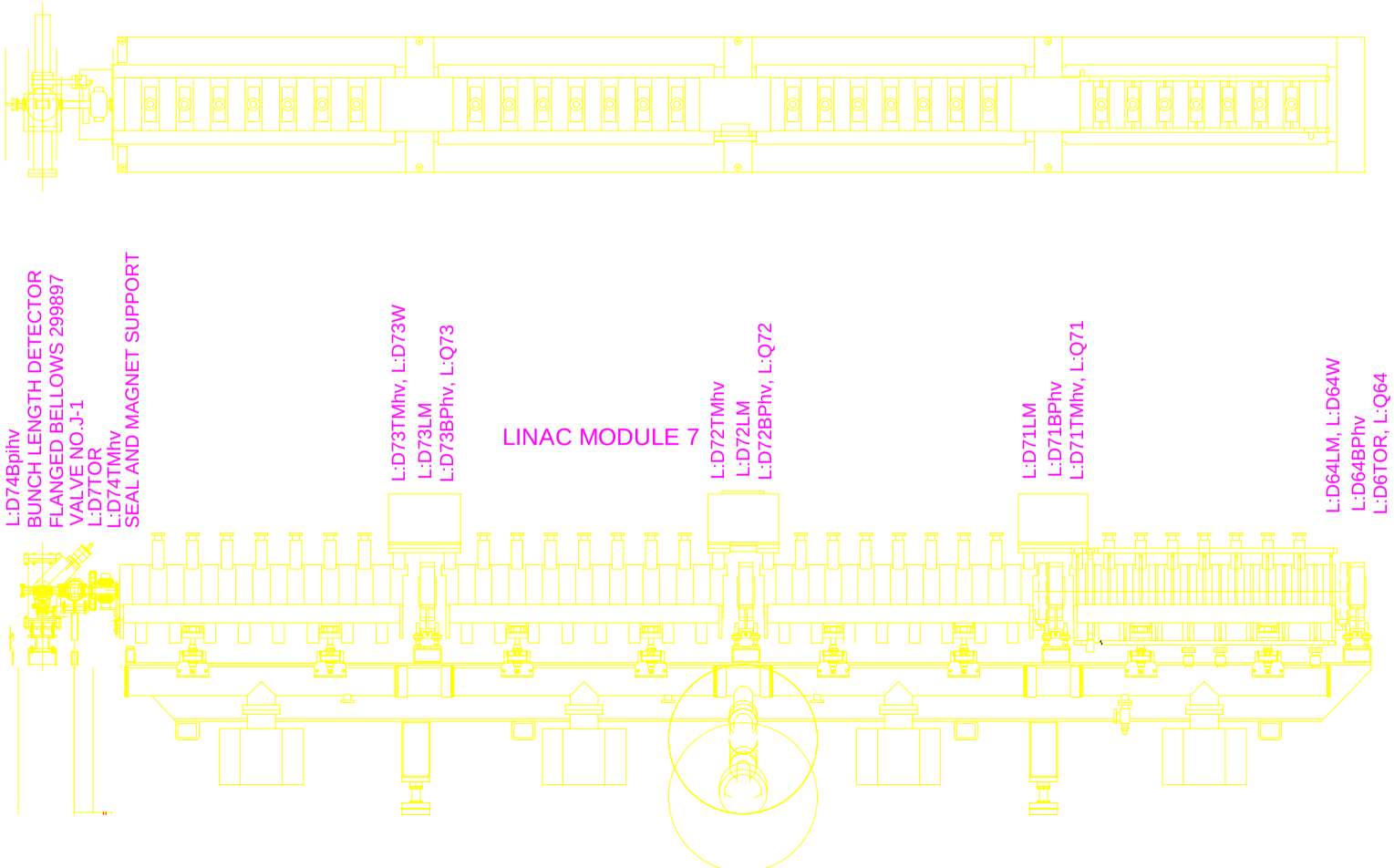
Booster Tower & Tunnel



Booster Tunnel

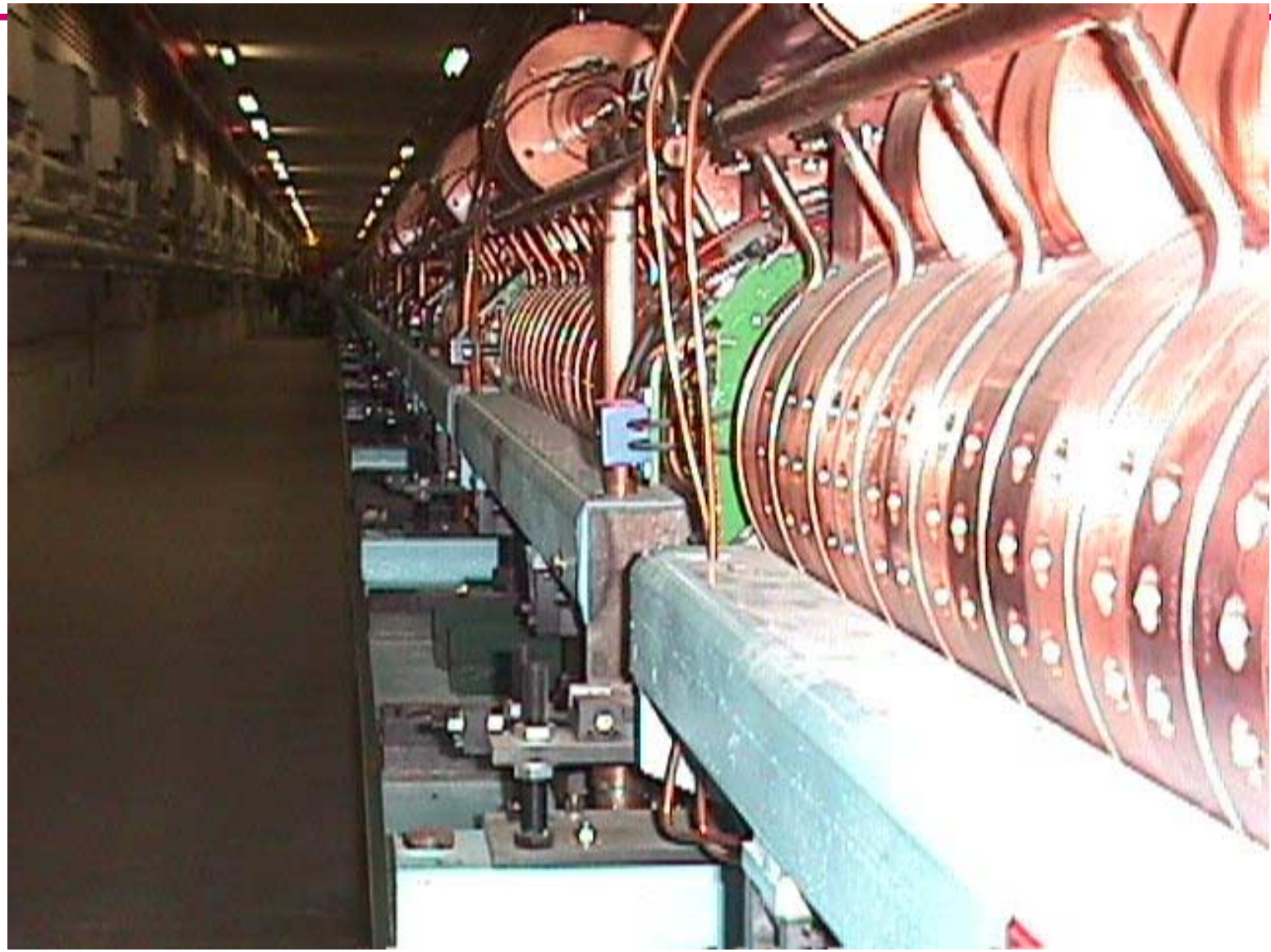
94 inches From Wall to Girder

Linac Accelerating Module



Cavity width is 12 inches/Girder width is 32 inches

Modules



12MW Klystron

11feet

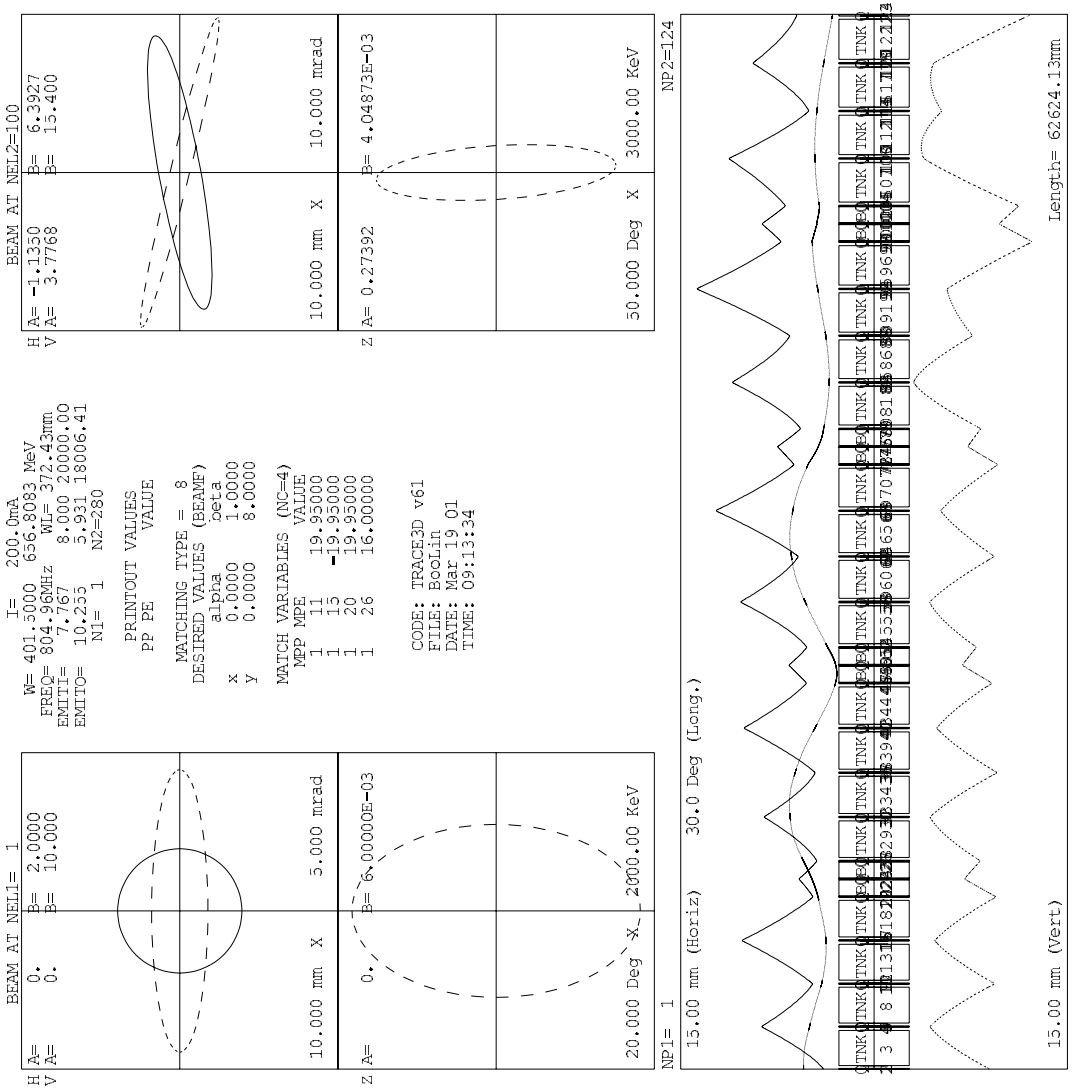
This is Linac Test Station for 200kW&12MW Systems

Booster East Gallery

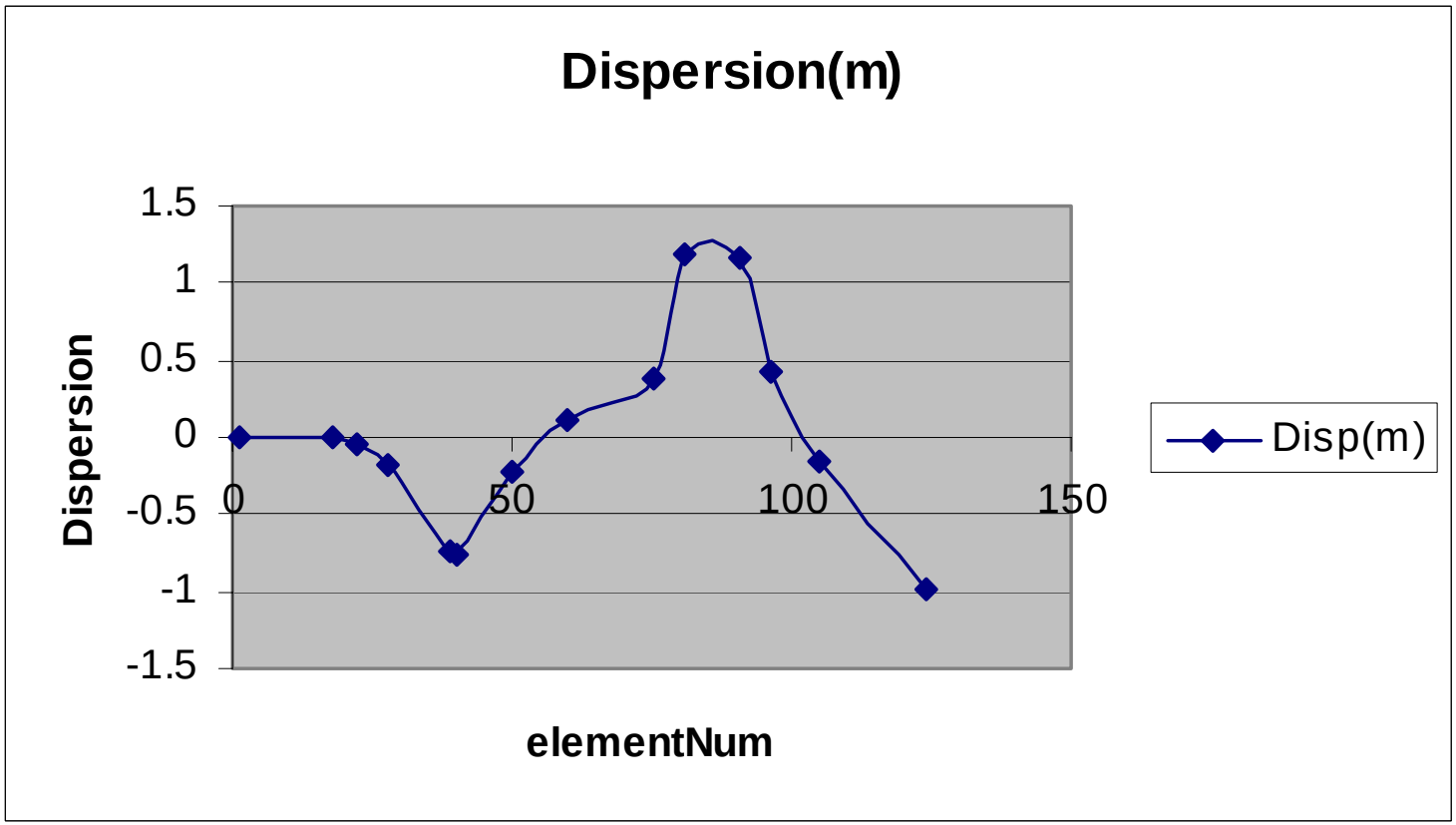
Booster East Gallery

Booster East Tower

Five Module Linac



There are four Bends, final energy is 656MeV


Dispersion(m)
1.5
1
0.5
0
-0.5
-1
-1.5
0
50
100
150
Dispersion
elementNum
Disp(m)

References

- 1-GeV Linac Upgrade Study at Fermilab,
  M. Popovic, et al., FERMILAB-Pub-98/266
- Present, Near Future and Future Performace of the Fermilab Linac, M. Popovic, FERMILAB-Pub-96/046