DR Layout Description

ILC DR Technical Baseline Review
Frascati, July 7, 2011

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Cornell University

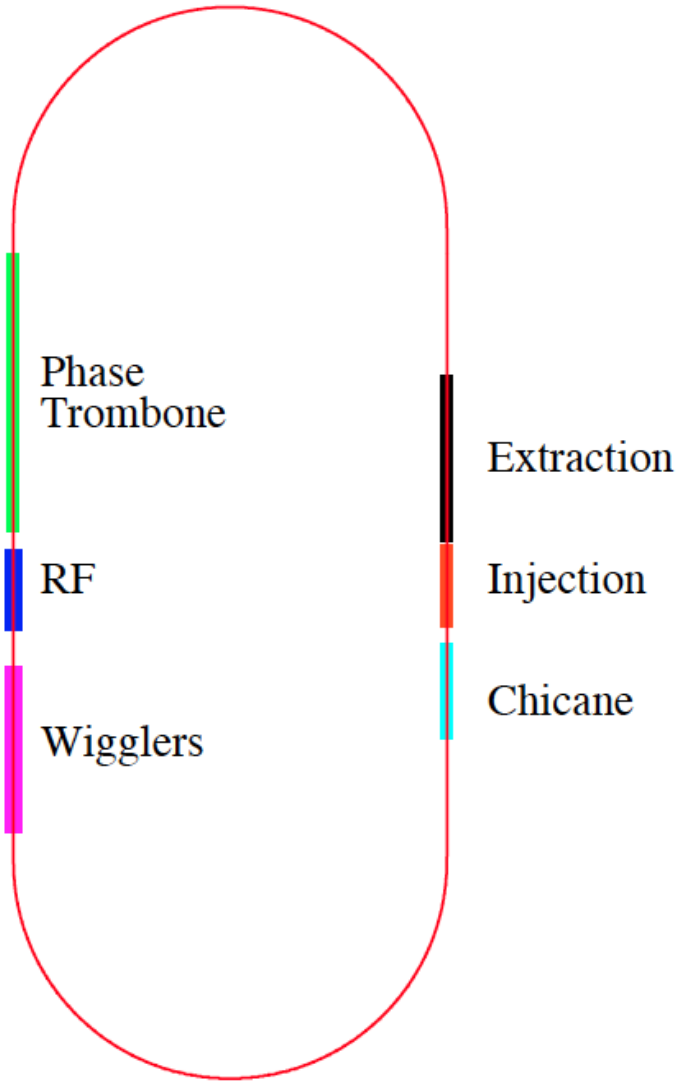
Introduction

- Dave has provided an overview of the overall layout
- This talk will focus on key elements of the present layout and the modifications from the previous baseline
  - **Principally:**
    - Straights and Alcove/Cavern Layout
    - Beam Line Spacing/Tunnel Diameter Issues
  - **CFS Discussions included:**
    - Rough Arc Estimate
    - Preliminary discussion of utilities specifications

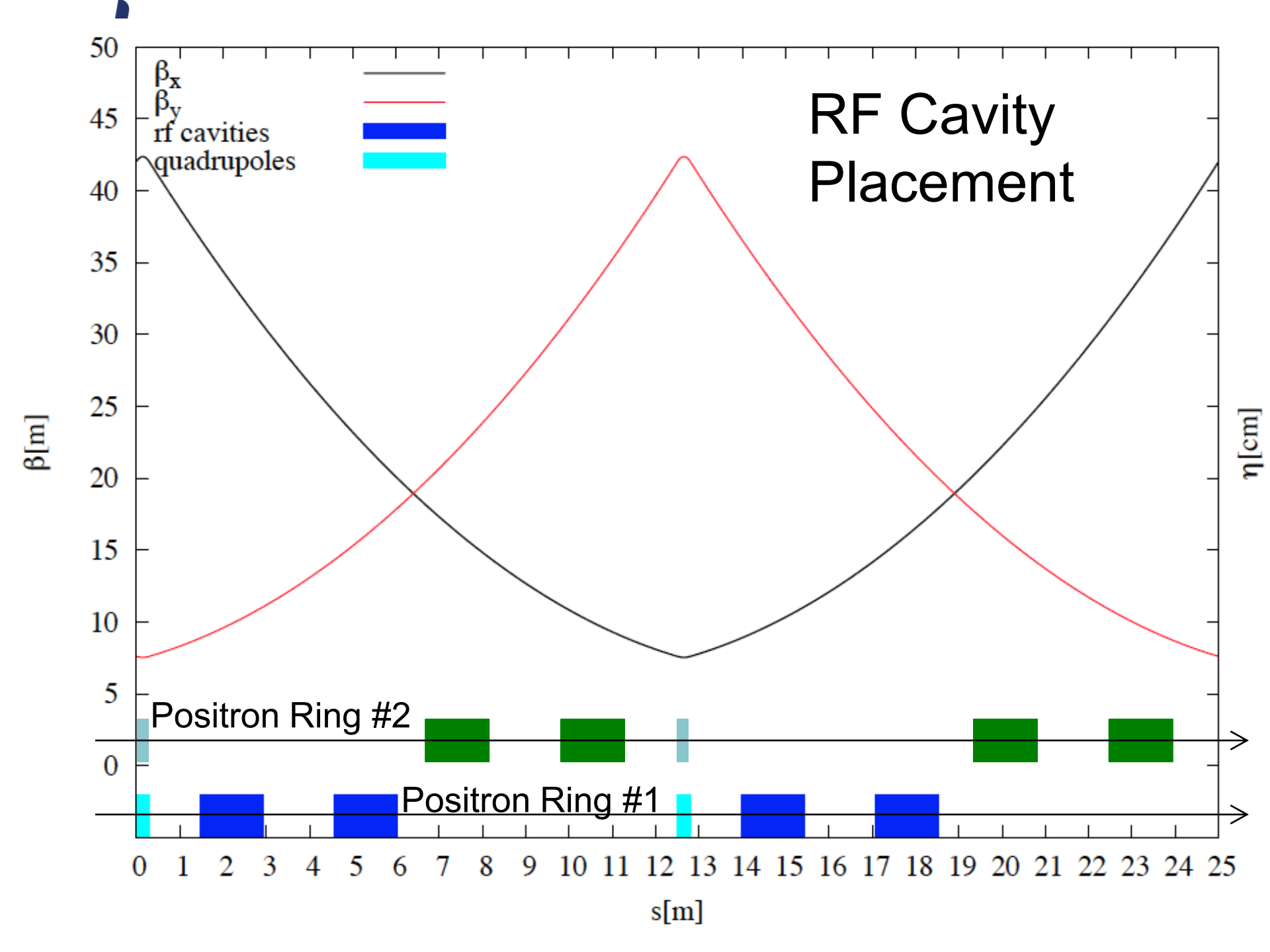
Straights Layout

- Layout Issues in Straights
  - **Minimize length consistent with 3.2km design requirements**
  - **Maintain injection/extraction layout**
  - **Minimize phase adjustment trombone**
  - **Scale the circumference chicane with the size of the ring**
  - **Space in RF & wiggler sections for all design options (low & high power, 10Hz ops)**
  - **Added space in wiggler section for photon absorber**

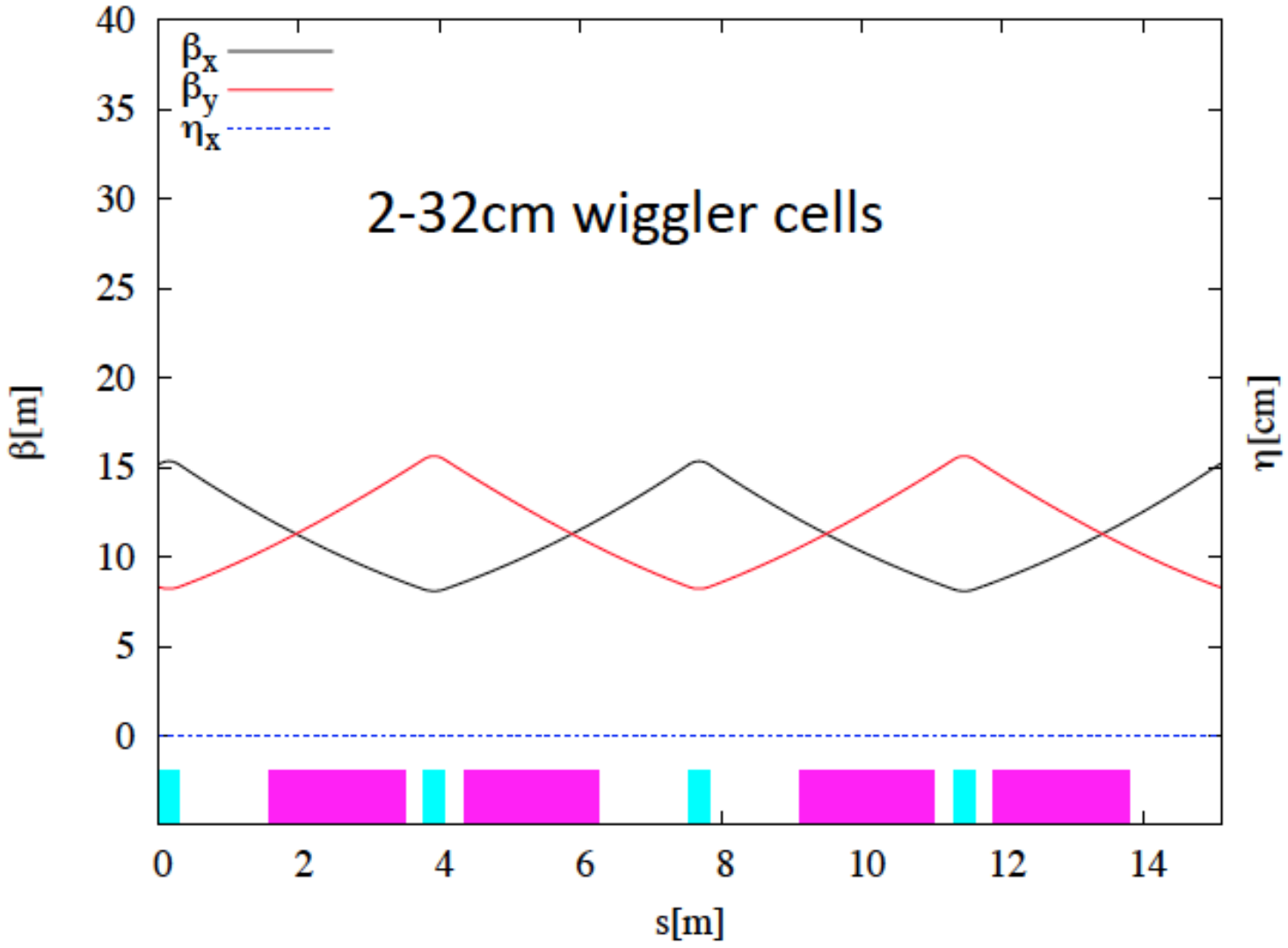
Interface with CFS



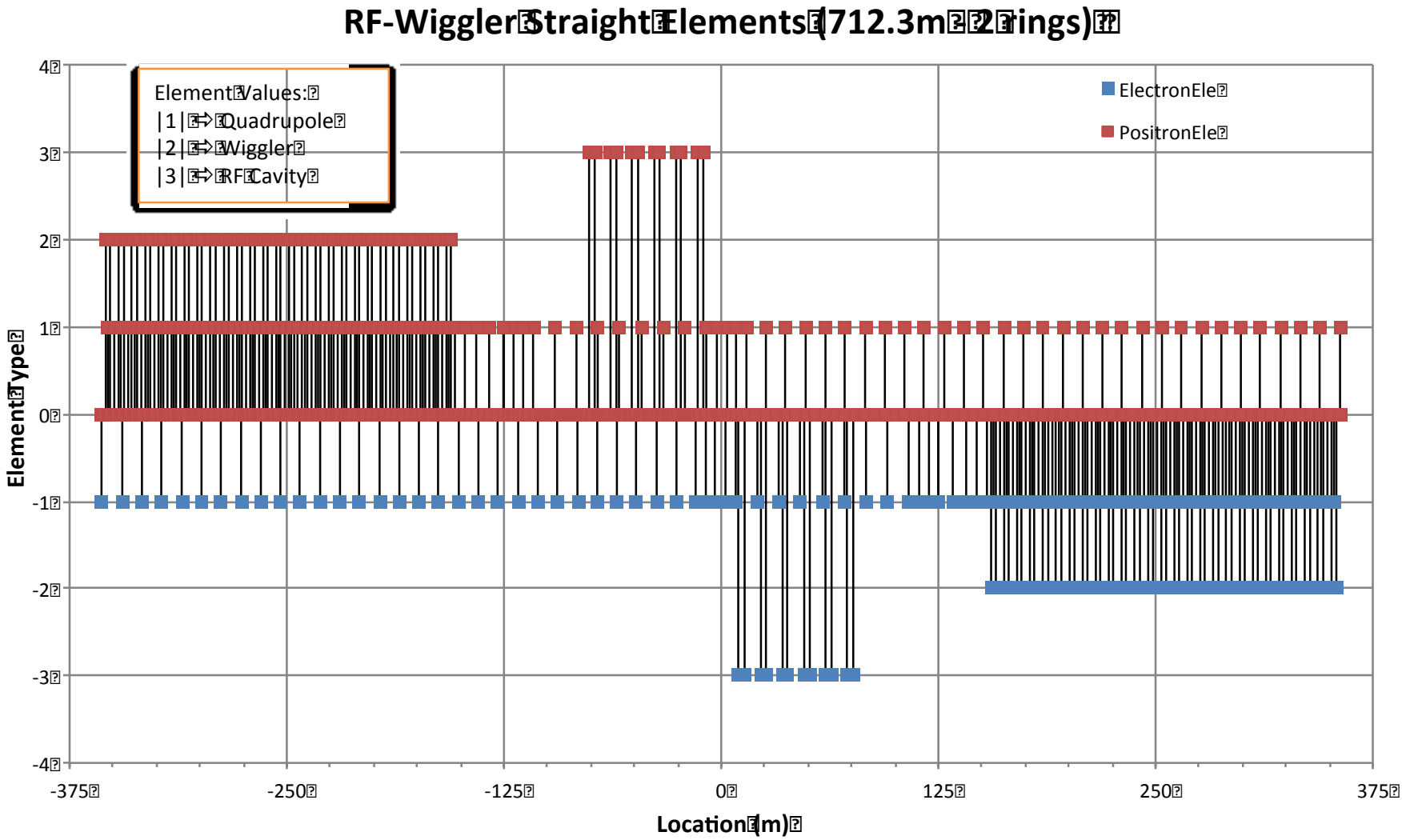
- June 2, 2011 Meeting
  - **Review shorter straights**
    - RF-Wiggler Layout
    - Cavern/Alcove Requirements
  - **Beam Line Spacing Presently set to 1.3m**
  - **Set tunnel diameter**
  - **Rough estimate of arcs**


RF Cavity Placement
βx
βy
rf cavities
quadrupoles
β[m]
η[cm]
s[m]
Positron Ring #2
Positron Ring #1
0
5
10
15
20
25
30
35
40
45
50
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

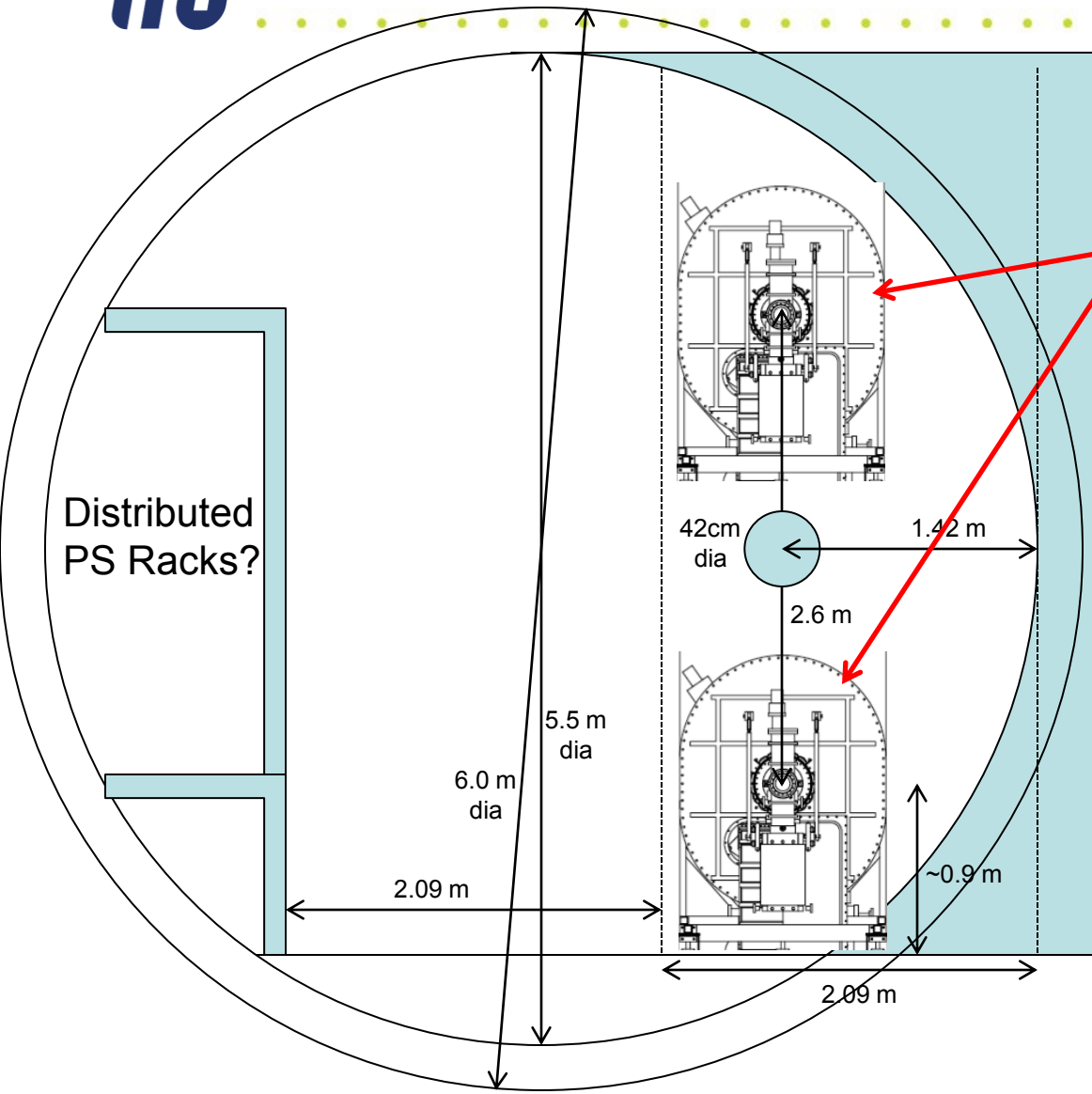
Wiggler Cell



RF-Wiggler Straight



Tunnel Diameter Issues

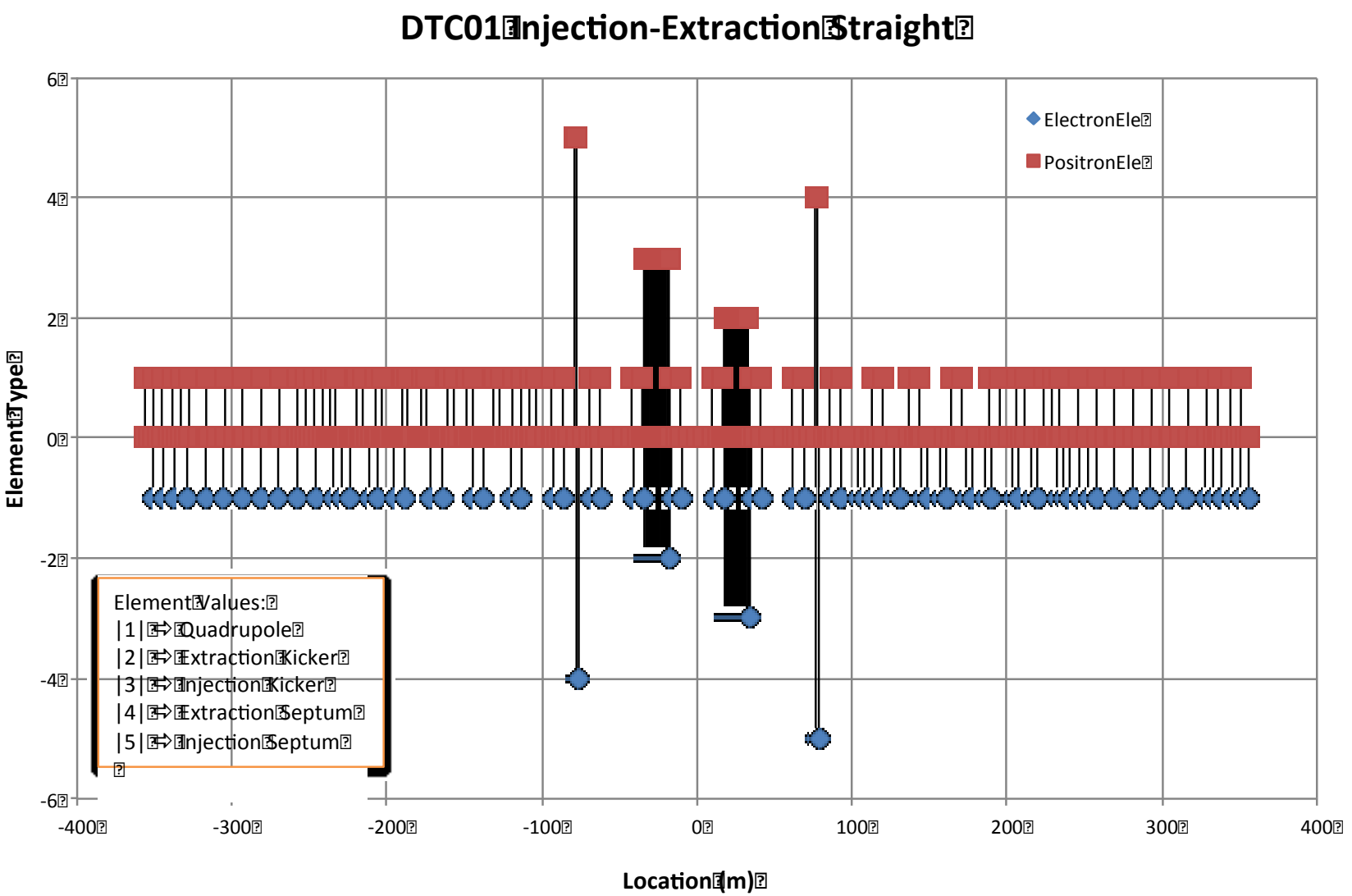


Assumptions:

1) Remove large foot floor supports
2) Assume waveguides are re-routed
3) Reduce scale to 90% (~half of potential reduction with 500MHz ⇨ 650MHz cavities
4) 1+2 ⇨ 0.85 × height, 3 gives another factor of 0.9
5) NOTE: No cryostats are located directly above each other when longitudinal positions are accounted for

RF Alcove

Injection-Extraction Straight



The Basic Racetrack