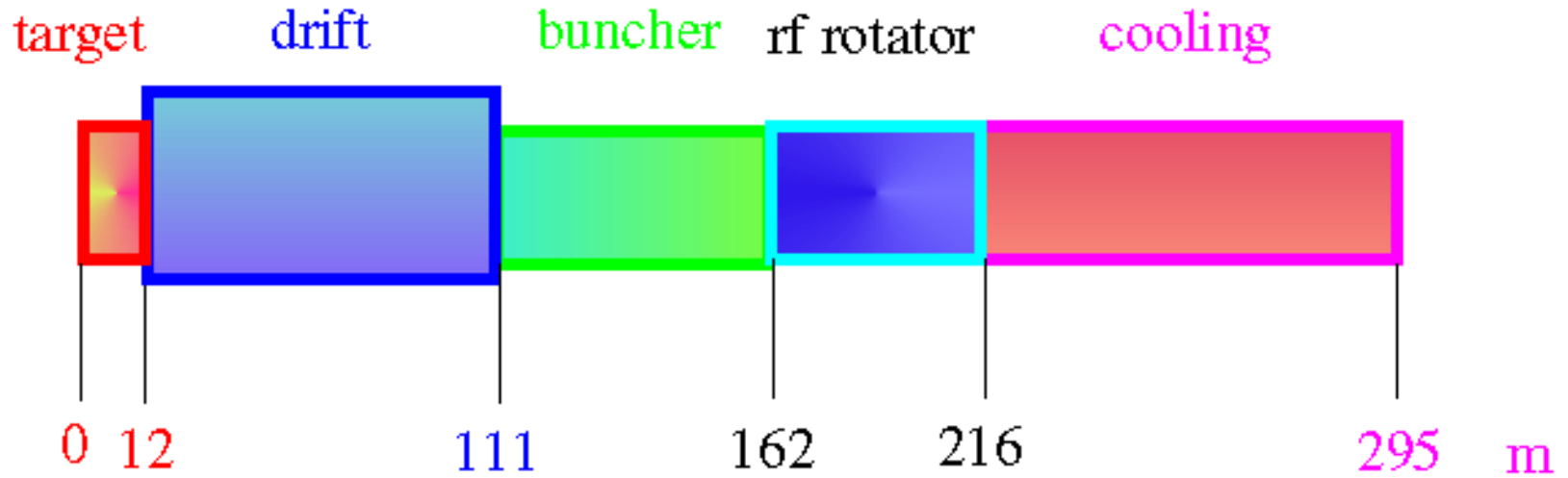


# Front End Status

**January 22, 2010**

**Harold G. Kirk**

# The Front End Layout



# Base Line

- Proton Beam
  - 4MW, IDS (5-15GeV)
- Target System
  - Hg Jet, 20T Solenoid
- Capture Channel
  - Taper 20T → 1.75T
- Phase Rotation
  - 201 MHz RF, 12 MV/m gradients
- Pre-cooler
  - Alternating 2.8-T solenoids, 15MV/m RF gradients

# Target System

- 8 GeV Proton Beam favored
- Multiple Beam entry points considered
- Proton Beam 3 micro-bunches with  $dt=100\mu s$

## Outstanding Issues:

- Nozzle design and simulations
- Hg Beam dump configuration
- Shielding design
- Hg handling system design

# Capture Channel

- Shorter decay channel (100m  $\rightarrow$  50m)

## Outstanding Issues:

- Optimization of field taper
- Impact of enhanced field (30T) on capture efficiency and meson emittance

# Phase Rotation

- Reduce length (100m  $\rightarrow$  60m)
- Reduce captured bunch train (18  $\rightarrow$  10)

## Outstanding Issues:

- Need for realistic solenoids, windows
- Increased solenoid field (1.75T  $\rightarrow$  2T)
- Requires increased RF gradient (12MV/m  $\rightarrow$  15MV/m)

**RF in magnetic field is the outstanding crucial issue!**

# Pre-Cooler

- Continued optimization studies of lattice

## Outstanding Issues:

- Consider using alternate lattice designs
  - FOFO Snake
  - Helical Cooling Channel

# Alternatives

Until the RF/Magnetic Issues are clarified, we must devote effort to considering alternatives:

- HP RF systems
- Magnetic Insulations lattices
- Shielded RF cavities
- Increased lattice lengths
- Be RF cavities

This issue be resolved or more Design and Simulation effort needs to be expended



# Front End Milestones

Milestone	Date
Specify Target Initial Configuration	FY10
Interim IDS-RDR Report	FY10
Specify Front End Initial Configuration	FY11
Front End Engineering Design	FY12
Costing of Front End	FY13
IDS-NF RDR Report	FY14