

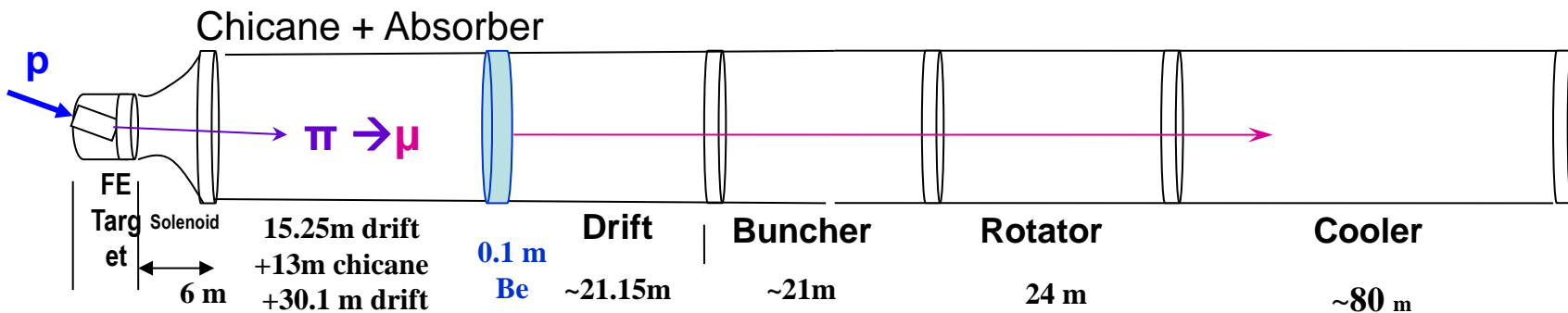
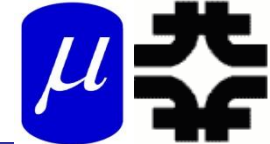
Front End – present status

David Neuffer

May 20, 2014

- **Front End for Muon Collider/ Neutrino Factory**
 - 325 MHz
 - With Chicane/absorber
- **Current status**
 - New targetry
 - Possible changes

325 Collider w/Update Chicane/Absorber



➤ Add 30 m drift after chicane

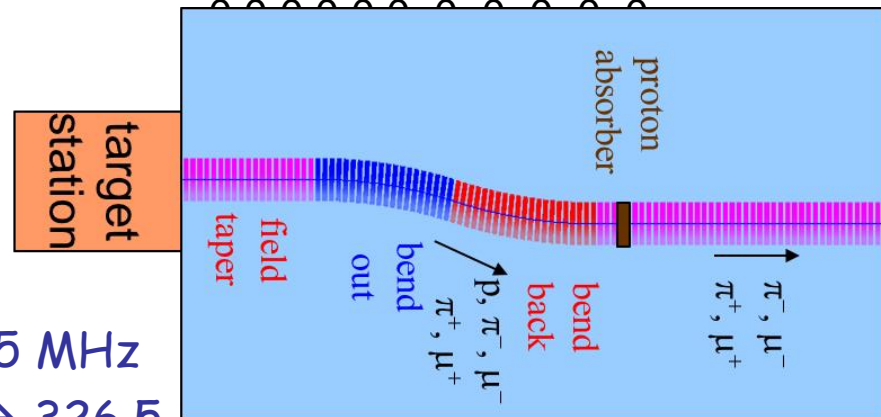
*6.5m → +21.67°, -21.67°

➤ Add chicane + absorber

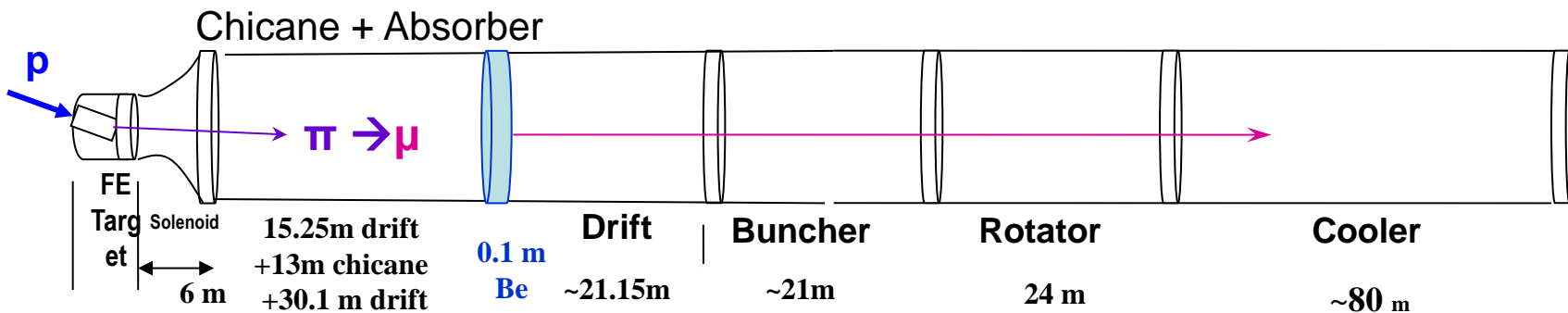
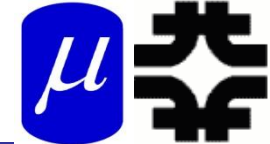
- particle 1-283 MeV/c
- particle 2-194 MeV/c
- absorber at 41m
 - 10cm Be
 - particle 1-250 MeV/c
 - particle 2-154 MeV/c

- Bunch (N=12) 0 → 15 MV/m : 496 → 365 MHz
- Rotate (N=12.045) - 20MV/m : 365 → 326.5 MHz
- Cool -325MHz -25 MV/m
 - $p_{ref}=245 \text{ MeV/c}$

SREGION ! bentsol
 6.5 1 1e-2
 1 0. 1.0
 BSOL
 1 2.0 0.0 1 0.283 0.0 0.058181
 0



325 Collider w/Update Chicane/Absorber



➤ Add 30 m drift after chicane

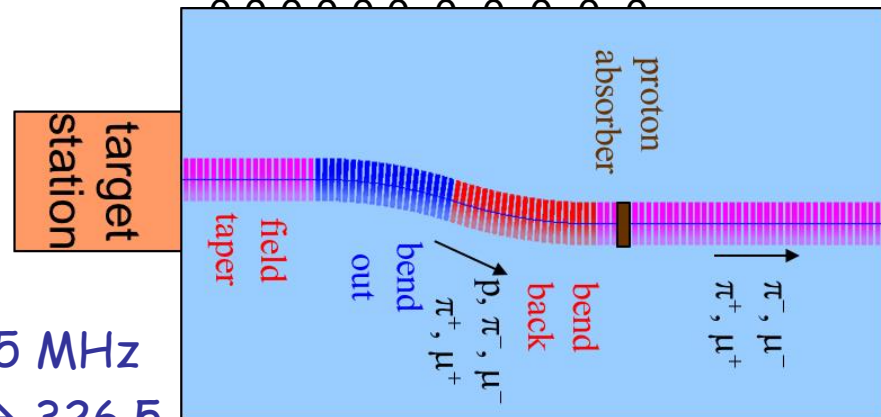
*6.5m → +21.67°, -21.67°

➤ Add chicane + absorber

- particle 1-283 MeV/c
- particle 2-194 MeV/c
- absorber at 41m
 - 10cm Be
 - particle 1-250 MeV/c
 - particle 2-154 MeV/c

- Bunch (N=12) 0 → 15 MV/m : 496 → 365 MHz
- Rotate (N=12.045) - 20MV/m : 365 → 326.5 MHz
- Cool -325MHz -25 MV/m
 - $p_{ref}=245 \text{ MeV/c}$

SREGION ! bentsol
 6.5 1 1e-2
 1 0. 1.0
 BSOL
 1 2.0 0.0 1 0.283 0.0 0.058181
 0

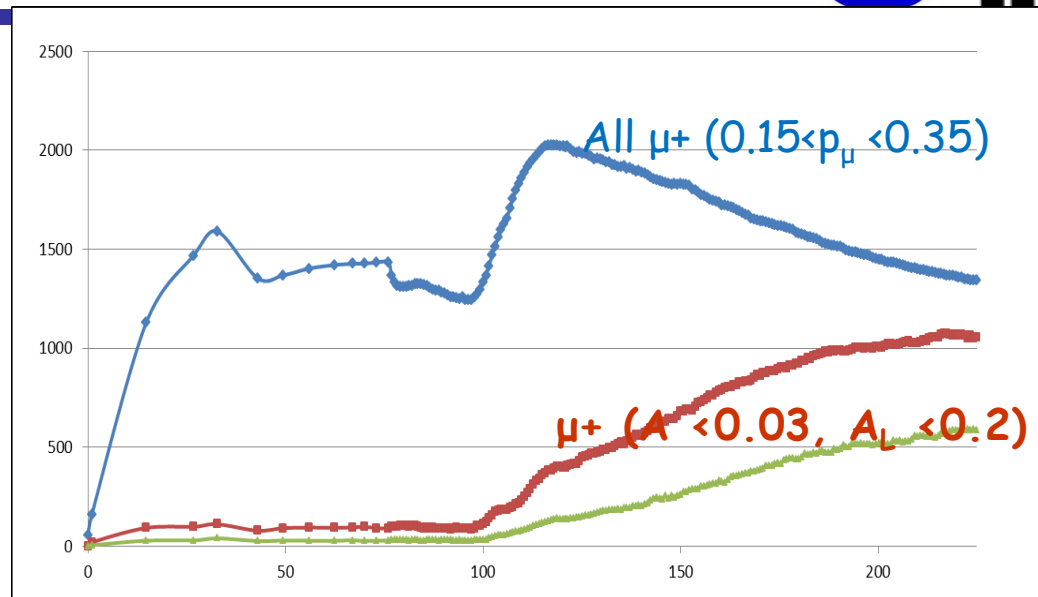


ICOOOL results

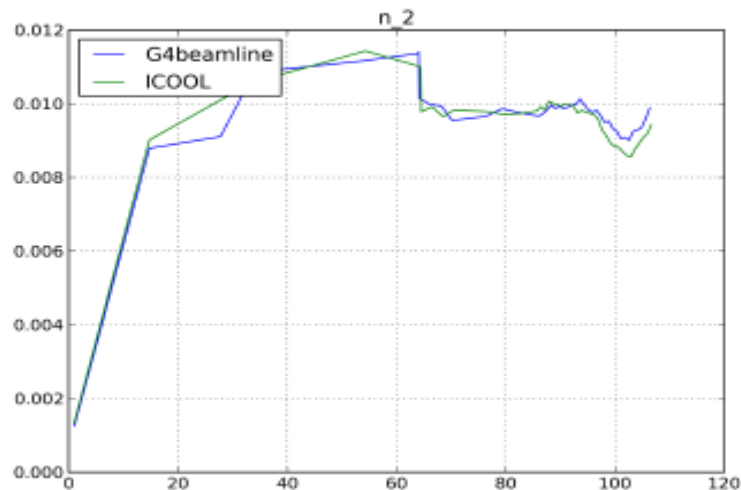


➤ 325 "muon collider" with chicane absorber

- with added drifts between chicane and absorber
 - ~30m
- $\sim 0.12 \mu/p \rightarrow \sim 0.1 \mu/p$
- smaller emittance beams
 - scraped to better fit



Useful muons (n_2 , typical cuts)



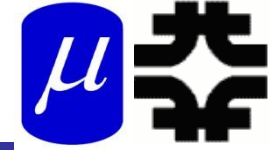
➤ Change to shorter taper

- 15m → 6m
- (Hisham) slight improvement in throughput (~5%)
- We are using Hishams more recent distributions
 - Gains ~5–10%
 - Total is now ~0.115 μ /p (in baseline ICOOOL simulation units)

- **Have included chicane/absorber in 325 MHz Front end**
 - Absorber is moved ~30m downstream to allow π decay before absorber
 - Using Hisham's latest generated reference particle sets
 - shorter taper

- **Reference cooling channel will be changed**
 - Transfer from neutrino factory 4-D cooler
 - Replace with 6-D "snake" cooler (?)

Current Status



I'M EXHAUSTED FROM ALL OF THE BASIC RESEARCH I'M DOING.

IT'S TOO BAD THAT THE VALUE OF MY WORK WON'T BE QUANTIFIABLE FOR ANOTHER TEN YEARS.

I'D LIKE TO SEE YOUR LAB REPORT.

SO... THE NEW RULE IS THAT WE WRITE DOWN STUFF?

Dilbert.com DilbertCartoonist@gmail.com

5-28-10 ©2010 Scott Adams, Inc./Dist. by UFS, Inc.