MARS SIMULATION RESULTS

Muons+Pions count at z=50 m with K.E. 80-140 MeV

Present baseline: $B_i = 20$ T, $B_f = 1.5$ T, $z_{end} = 15$ m.

Tapered field using inverse-cubic field ($P = 1$)
**Muons within required acceleration acceptance cuts**

- $0.1 < P_z < 0.3$ GeV
- Transverse cut $R < 0.3$ m
- Longitudinal cut $0.15$ m

---

**Solenoid Field along $z$-axis**

- $20 \rightarrow 1.5$ T
- $15 \rightarrow 1.5$ T
- $15 \rightarrow 1.8$ T
- $15 \rightarrow 2.0$ T

---

**Shorter taper better survive the phase rotator & cooling**

- $1.5$ T

---

**Muons (w transverse cut n1)**

- $0 \rightarrow 20$ T
- $5 \rightarrow 15$ T
- $10 \rightarrow 15$ T
- $15 \rightarrow 15$ T
- $20 \rightarrow 1.5$ T

---

**Taper Length [m]**

- $5$ to $45$ m

---

**M**

**U**

**O**

**N**

**COUNT AT END OF "FRONTEND"**
TRANSMISSION THROUGH FRONT END

Pz & Σ cut

Trans, Pz, & Σ cut

Aperture 0.4 → 0.3 m

7%
1- Taper solenoid field: 20 --> 1.5 T over 15 m
2- ICOOL applied aperture for decay region R_aperture= 0.4 m & 0.3 afterwords
3- Good particles are those who satisfy the following conditions/cuts
   1- Survived the phase rotator and cooling sections
   2- Fall within required acceleration acceptance cuts
      - 0.1 <Pz< 0.3 GeV
      - Transverse cut R < 0.3 m
      - Longitudinal cut 0.15 m
DISTRIBUTIONS OF PARTICLES SURVIVED THE FRONT END AND ACCELERATION CUTS

Particle radii distribution \( \text{Ltaper}=15 \)

![Graph showing particle radii distributions for different magnetic field configurations.](Image)
DISTRIBUTIONS OF PARTICLES SURVIVED THE FRONT END AND ACCELERATION CUTS

Particle radii distribution $\text{Ltaper}=15$

---

---

---
DISTRIBUTIONS OF PARTICLES SURVIVED THE FRONT END AND ACCELERATION CUTS

Particle radii distribution \( \text{Ltaper}=22 \text{ m} \)

- **N [Muons]**
  - R [m]
  - P_{\text{transverse}} \text{GeV}/C
  - \( P_{\text{transverse}}/\sqrt{B} \) GeV/Tesla

\[ Z=0 \quad Z=9 \quad Z=18 \quad Z=50 \]
DISTRIBUTIONS OF PARTICLES SURVIVED THE FRONT END AND ACCELERATION CUTS

Particle radii distribution $Ltaper=36$

[Graphs showing distributions of particles]