J-PARC Hadron Hall : EXPERIMENTAL REPORT on RUN# 29

Group	E15/E17	Date (Submitted)	Feb.6, 2010
Reporter	Name	e-mail address	
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Summary and Results

i) +0.75 GeV/c separated beam (ES1=+- 200 kV, Ni target)
Beamline acceptance study (K^+)

ii) -0.75 GeV/c separated beam (ES1=+- 150 kV, Ni target)
Beamline acceptance study (K^-)

iii)+-0.65, +-0.70, +-0.75, +-0.80, +-0.85, +-0.90 GeV/c unseparated (Ni target)
D2-D3 tuning, D3-D4-D5 tuning (fine tune of beam axis)
Trigger timing study

iv) +-0.70, +-0.75, +-0.80, +-0.85, +-0.90 GeV/c separated beam (+- 200kV, Ni/Pt targets)
CM scan to find K^+/K^-/p/pbar setting for each momentum
Momentum-target dependence studies of K^+/K^-/p/pbar yield and K/others ratio

v) +0.75/+0.90 GeV/c separated beam (ES1 = +-200kV Ni target)
IF-V offset study with p/K^+

vi) +0.75 GeV/c unseparated beam (Ni target)
MS1 offset study with p

SCHEDULED and EXECUTED MACHINE TIME, BEAM CONDITION, DOWN TIME, Priority etc.

Jan. 20 0:00 ~ Jan.20 10:00 +0.75 GeV/c unseparated->+-200 kV ($4*10^{11}$ ppp 320W Ni)
Jan. 21 8:00 ~ Jan. 21 18:30 +0.70~+0.85 GeV/c, unseparated ->+-150 kV ($6*10^{11}$ ppp 480W Ni)
Jan. 28 15:00 ~ Jan. 29 07:00 ($1.3*10^{12}$ ppp 1kW Ni -> Pt at Jan. 28 19:30)
Feb. 1 20:30 ~ Feb.2 10:00 ($1.3*10^{12}$ ppp 1kW Ni)
Total 50.0 hrs

Comments/Requests

Feb. 12 2010

Run#29 Report

K1.8BR beamline detector subgroup

for J-PARC E15/E17/E31

Summary of beam study of Run#29

0. D2-D3 tune, D3->D4->D5 tuning : **+0.75 GeV/c unseparated (Ni target) at Jan.20**

1. Beamline acceptance study (by K^+) : **+0.75 GeV/c separated (ES1=±200 kV, Ni target) at Jan.20**

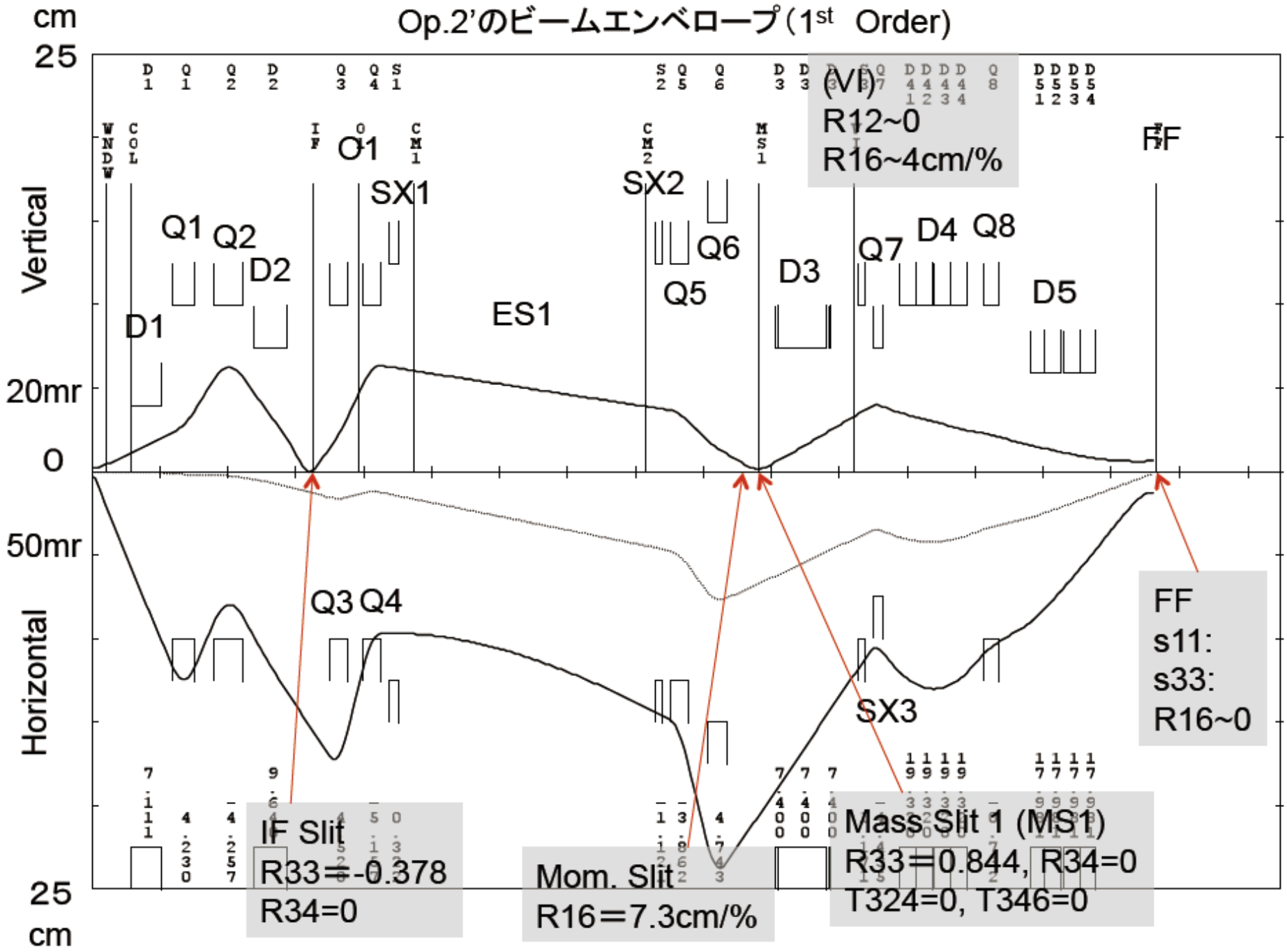
2. Beamline acceptance study (by K^-) : **-0.75 GeV/c separated (ES1=±150 kV, Ni target) at Jan.21**

3. D3-D4-D5 tuning : **+0.65, 0.70, 0.75, 0.80, 0.85, 0.90 GeV/c unseparated (Ni target) at Jan.21 and Jan.28**
- *fine tune of beam axis with unseparated beam)
- *Trigger study

4. CM scan and yield study : **±0.70~0.90 GeV/c separated (ES1 = ±200kV, Ni/Pt targets) at Jan.28 and Feb.1~2**
- *Finding K^+/K^-/p/pbar setting for each momentum
- *Momentum-target dependence studies of K^+/K^-/p/pbar yield and K/others ratio

5. IF-V offset tune : **+0.75/+0.90 GeV/c separated beam (ES1 = ±200kV Ni target) at Feb.2**
- * With 0.75/0.90 GeV/c p and K^+

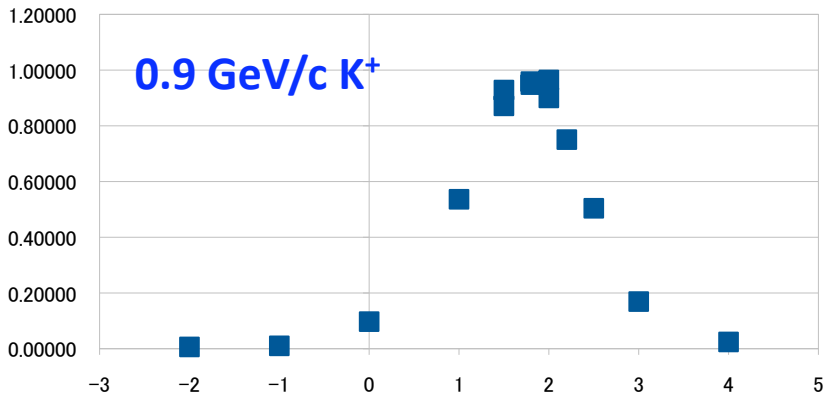
6. MS1 offset tune : **+0.75 GeV/c unseparated beam (Ni target) at Feb.2**
- * With 0.75 GeV/c p

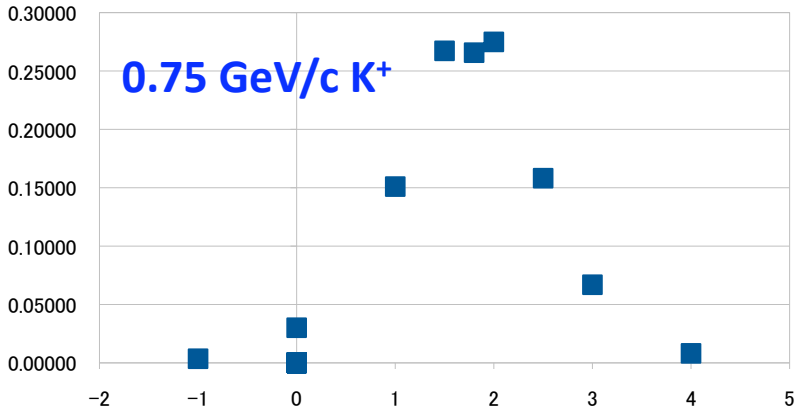

Op.2'のビームエンベロープ(1st Order)
cm
25
Vertical
20mr
0
50mr
Horizontal
25
cm
D1
Q1
Q2
D2
Q3
Q4
S1
IF
O1
CM1
SX1
ES1
CM2
SX2
S2
Q5
Q6
MS1
D3
Q7
D4
Q8
D5
FF
(VI)
R12~0
R16~4cm/%
IF Slit
R33=-0.378
R34=0
Mom. Slit
R16=7.3cm/%
SX3
Mass Slit 1 (MS1)
R33=0.844, R34=0
T324=0, T346=0
FF
s11:
s33:
R16~0

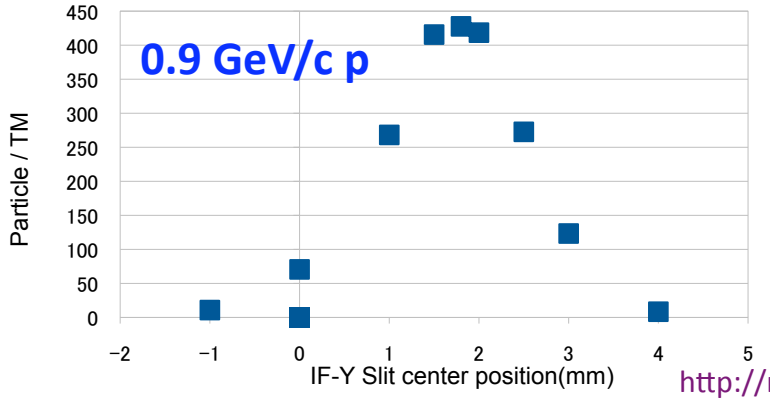
IF-V offset study

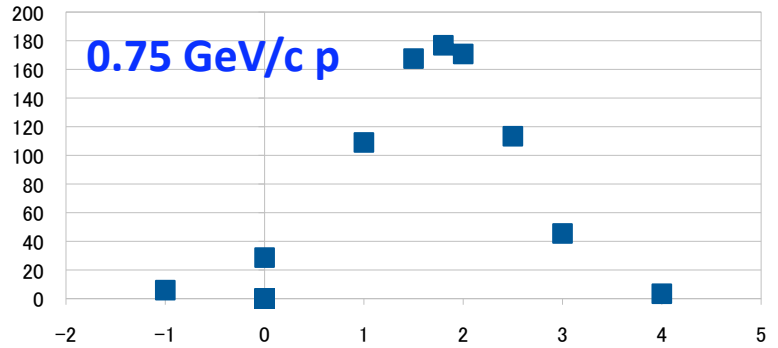
*ES1=±200kV, K^+-tune/p-tune (avoiding pile-up)
*MS1: ±4.7mm(2×design value, to let all p/K^+ go through)
*IF-V : width 0.4mm, only the central position is varied.
*IF-H/Mom.slit: full open (±130mm, ±180mm)
*Measure with both K^+ and p
*+0.9 GeV/c -> reconfirmed at +0.75 GeV/c

IF-V center : +1.8mm (+2.0mm for run#28, 0mm for run#22/26/27)









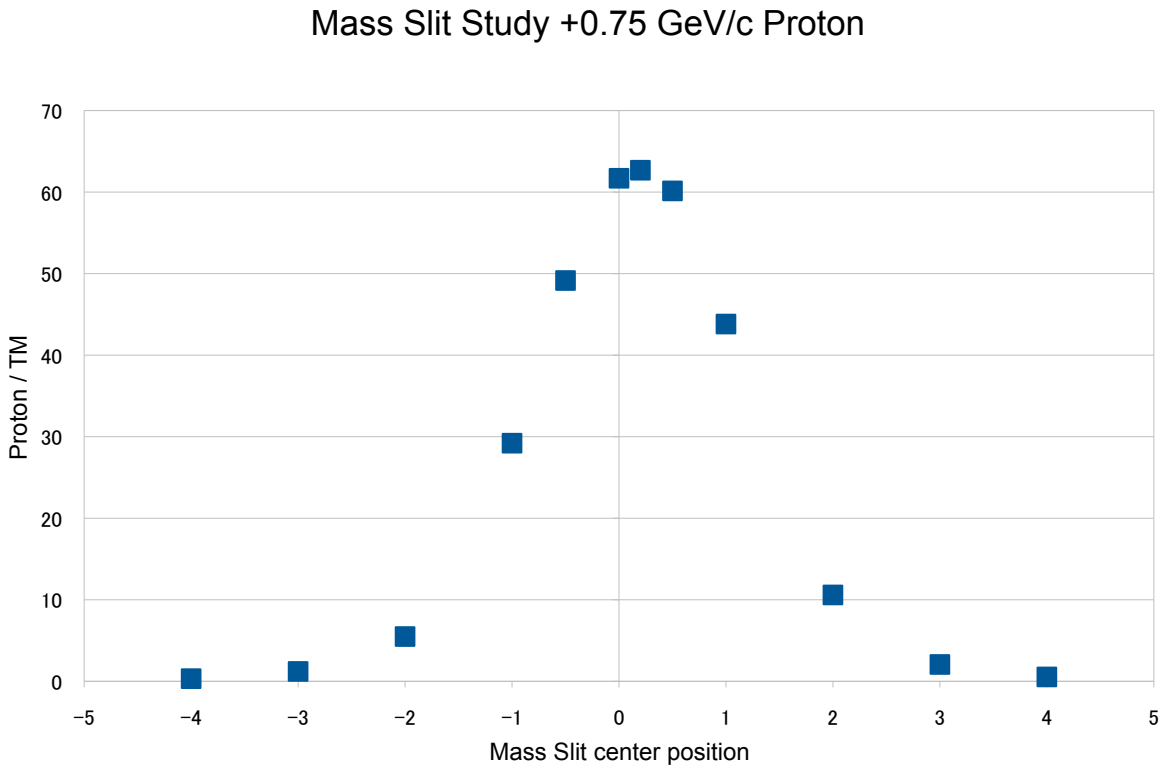
http://meson.riken.jp/J-PARC/K1.8BR/beamtune/xls/20100201/100202slitstudy.xls

K1.8MS1 offset study

MS1 offset is hardly detactable by separated beam, as the offset can be always compensated by CM -> usage of **unseparated** beam.

***ES1=0kV, unseparated beam**
***IF-V: +1.6/+2.0mm (optimum)**
***MS1 : width 0.6mm, only the centeral position is varied.**
***IF-H/Mom.slit: full open (±130mm, ±180mm)**
***Measure with p number (Kaon is not countable online by pile-up)**
***+0.75 GeV/c**

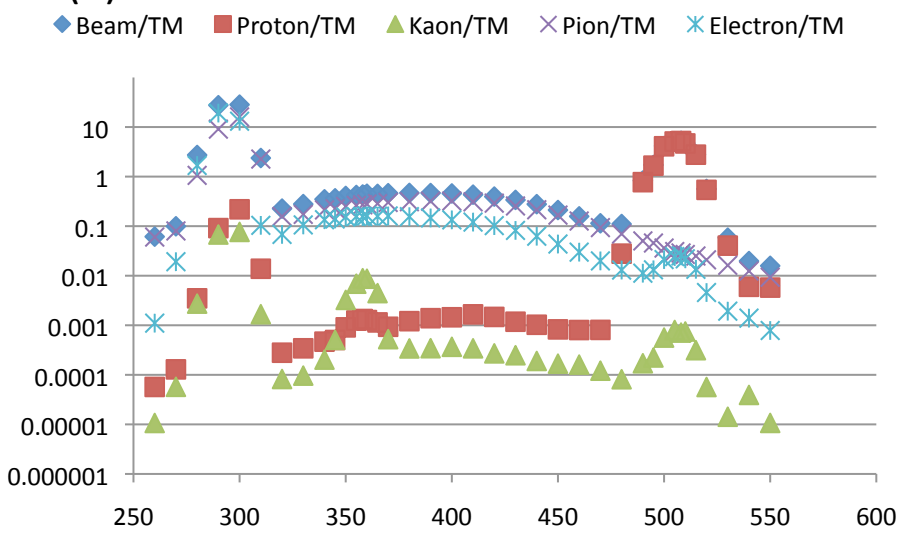
MS1 center : +0.2mm (0.0 mm for run#28 and before)



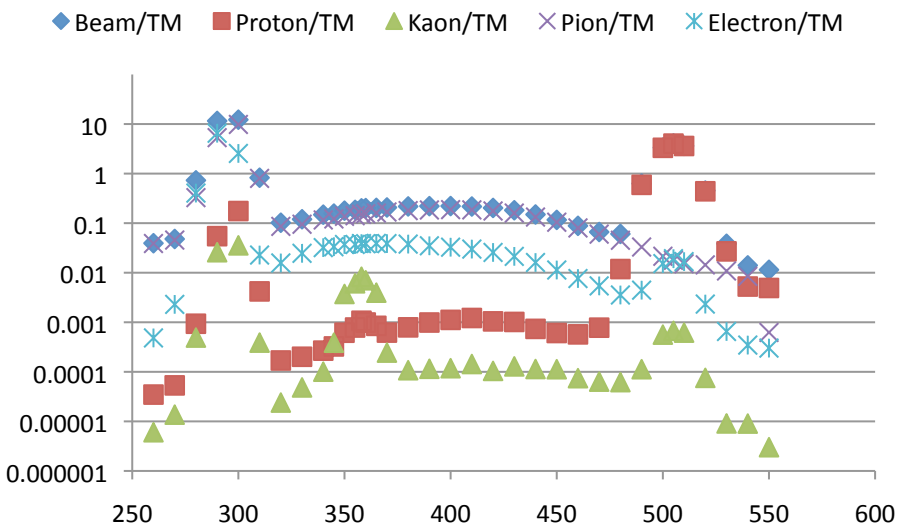
http://meson.riken.jp/J-PARC/K1.8BR/beamtune/xls/20100201/100202slitstudy.xls

CM scan for ±0.70 GeV/c

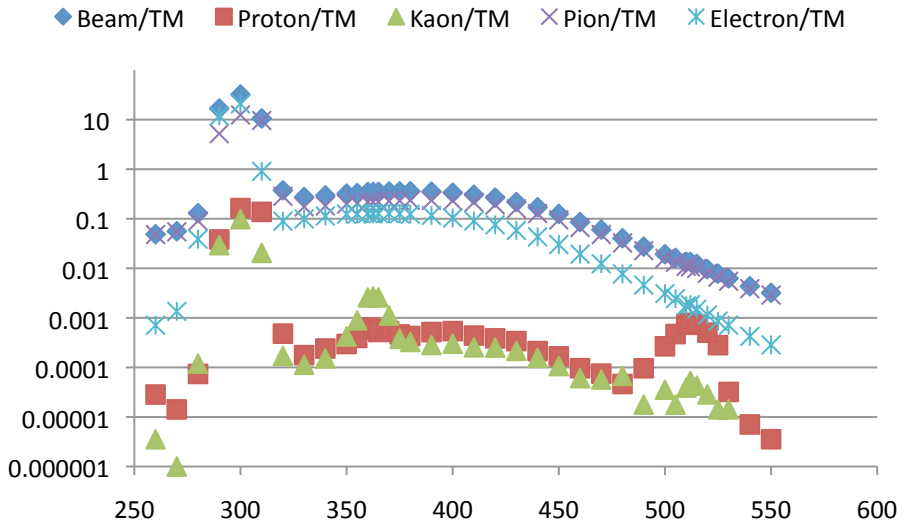
Ni(+)



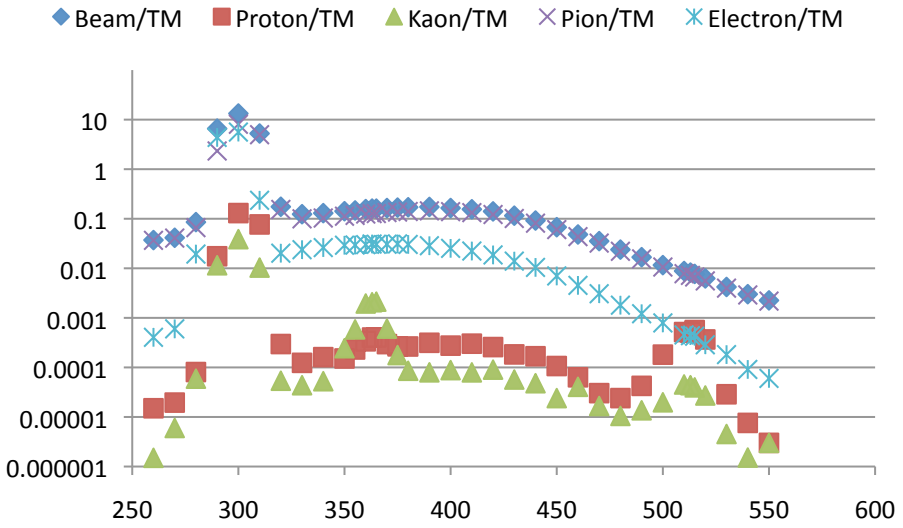
Pt(+)



Ni(-)

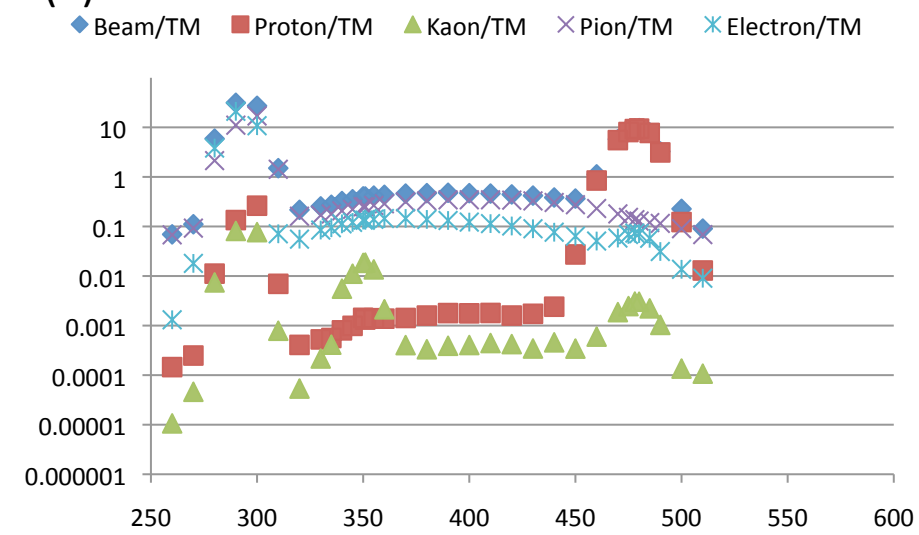


Pt(-)

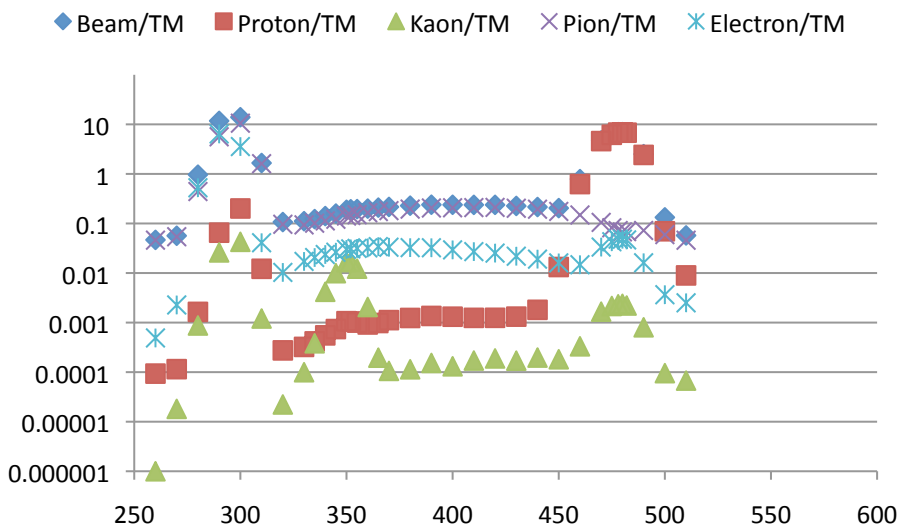


CM scan for ±0.75 GeV/c

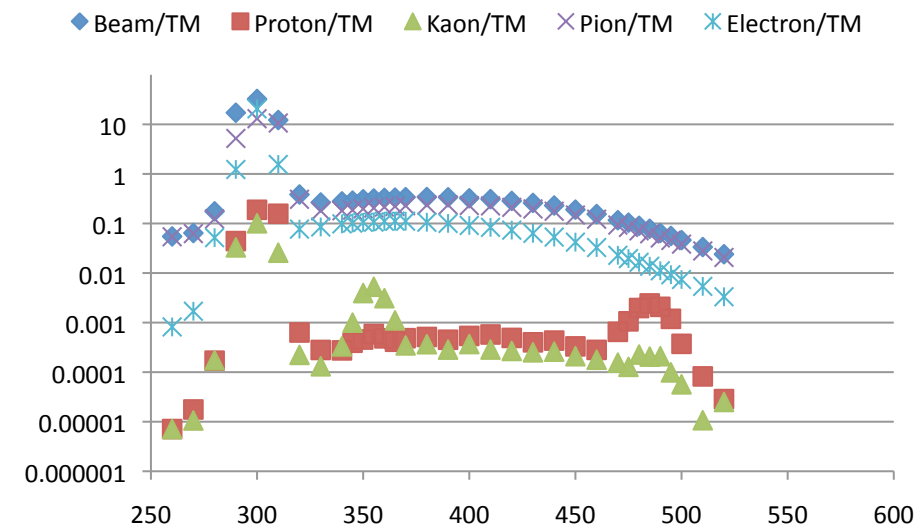
Ni(+)



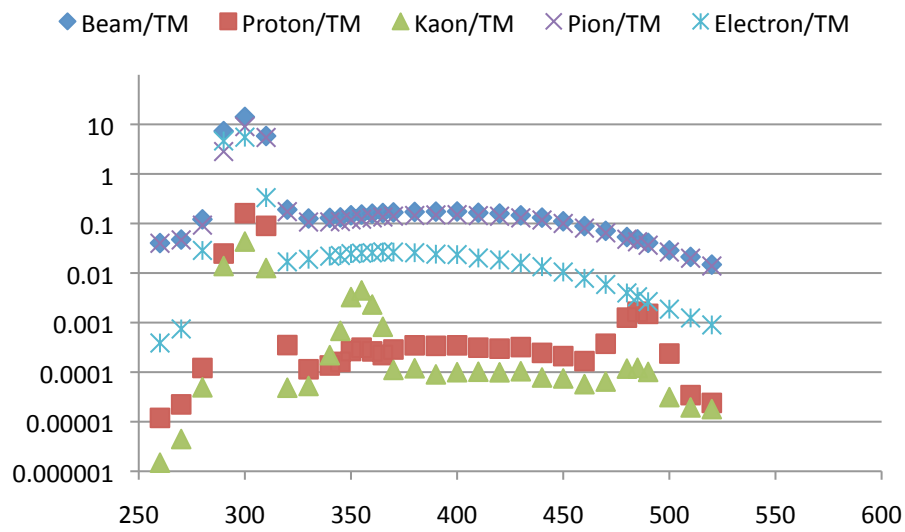
Pt(+)



Ni(-)

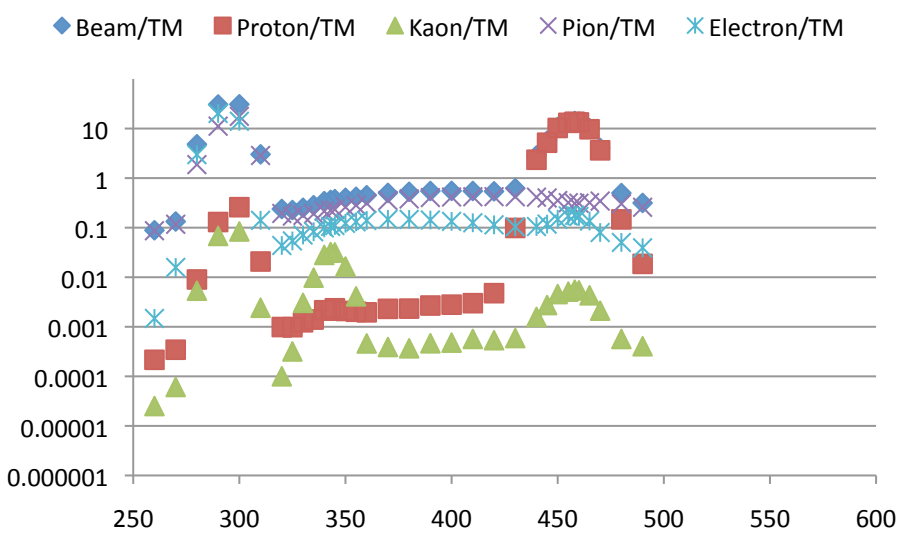


Pt(-)

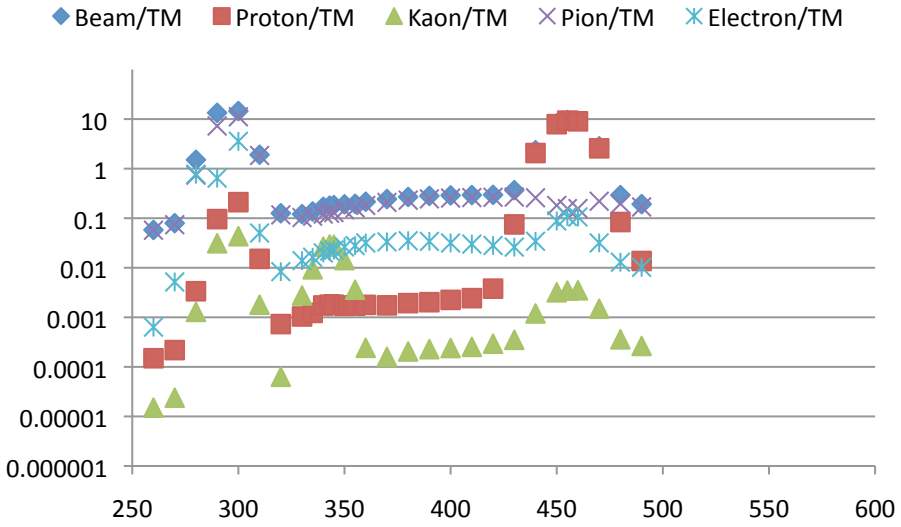


CM scan for ±0.80 GeV/c

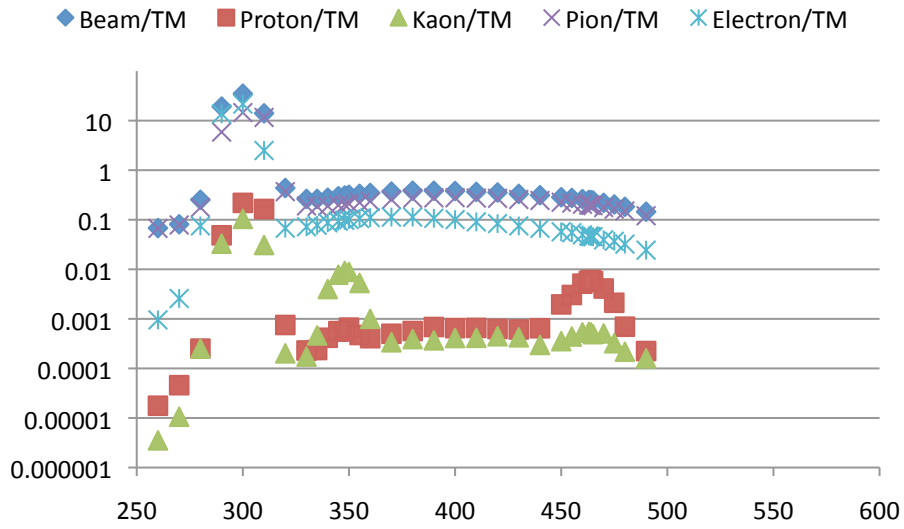
Ni(+)



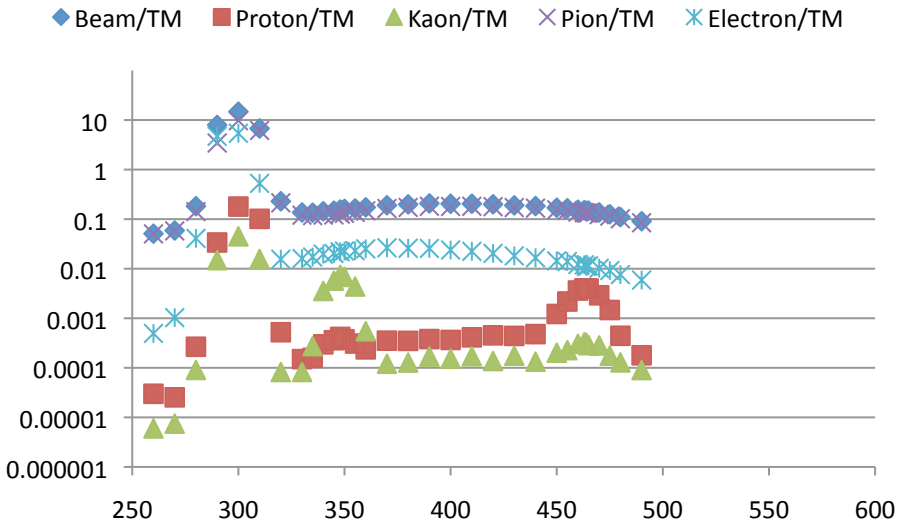
Pt(+)



Ni(-)

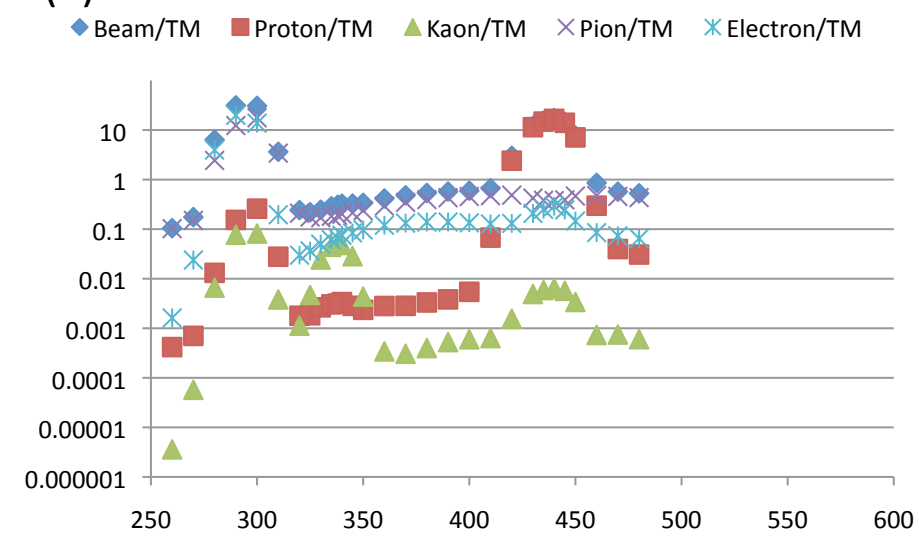


Pt(-)

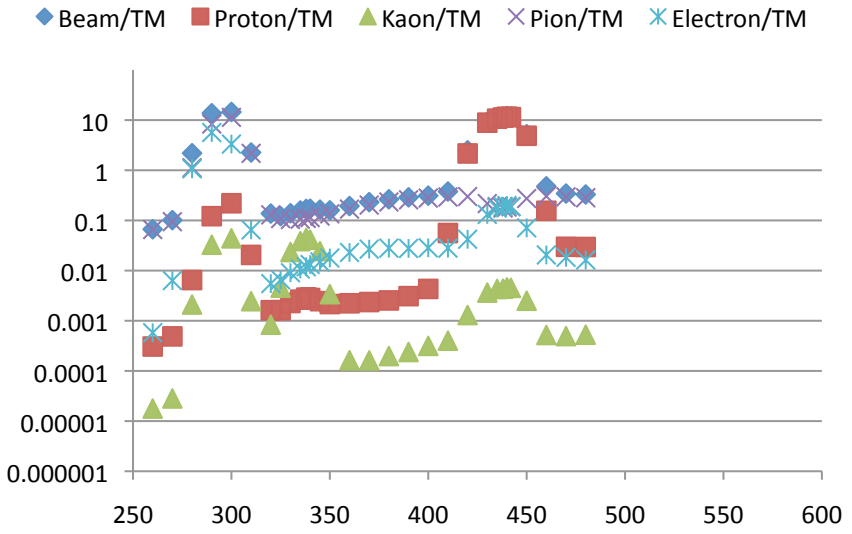


CM scan for ±0.85 GeV/c

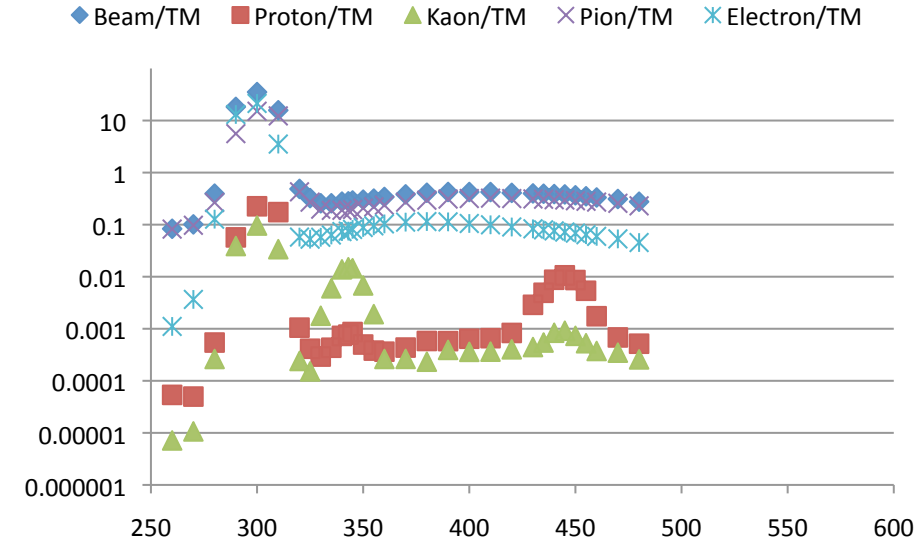
Ni(+)



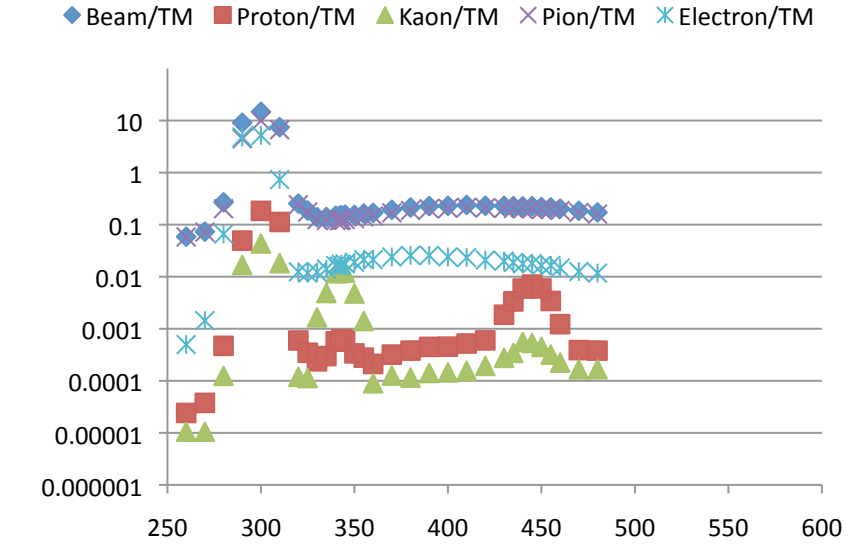
Pt(+)



Ni(-)

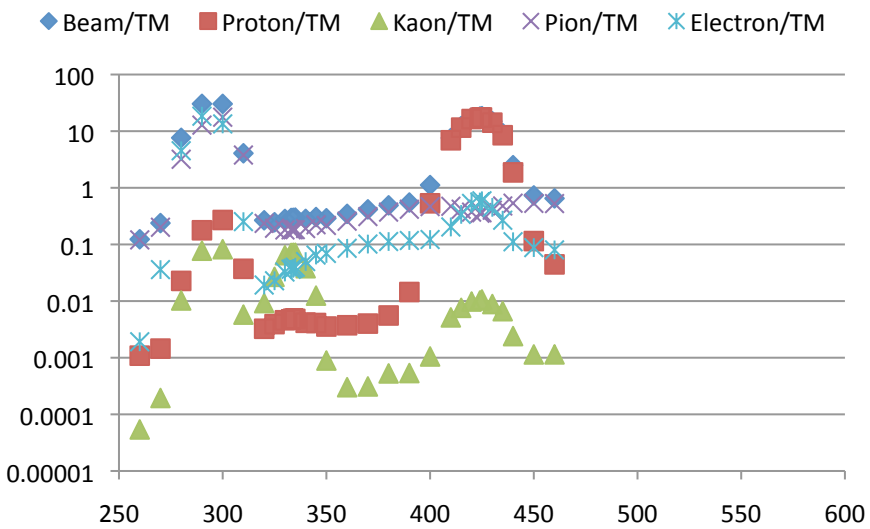


Pt(-)

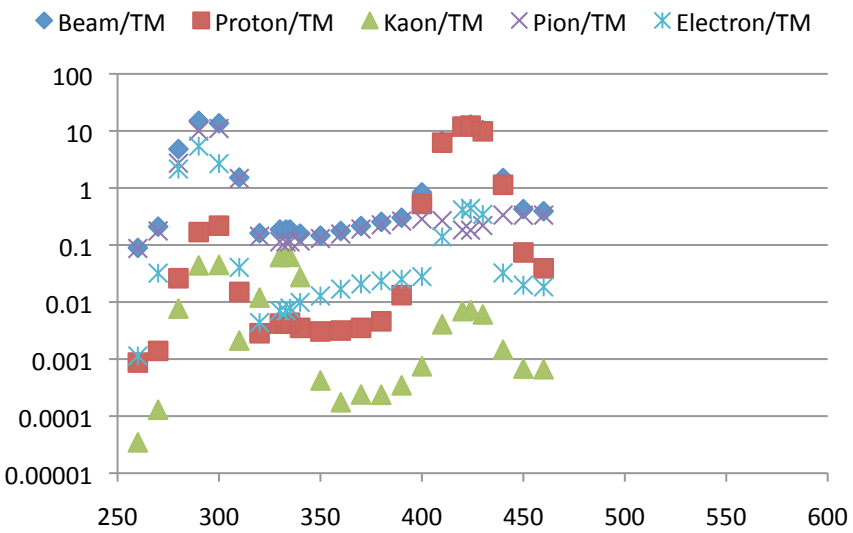


CM scan for ±0.90 GeV/c

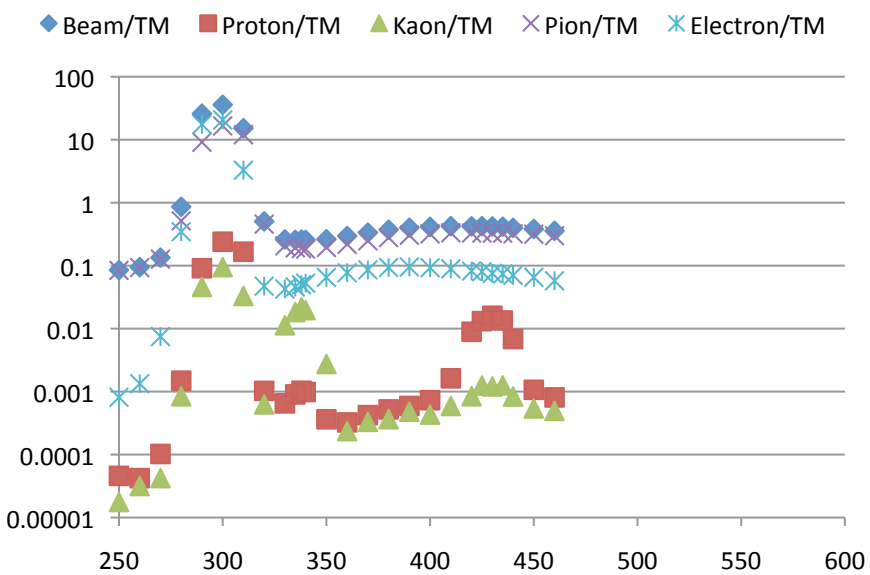
Ni(+)



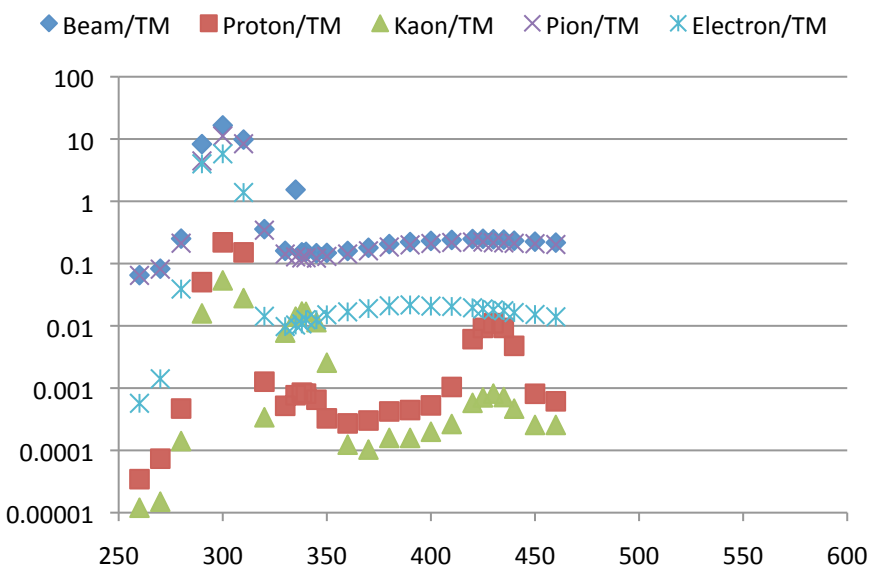
Pt(+)



Ni(-)



Pt(-)



Beam study plan of Run#30

0. **Kick-angle (i.e. CM) dependence of yield : separated beam with ES1=±40~200 kV (scanned), Ni target (Feb. 15)**
   *"pbar" by changing ES1 voltage and adjusting CM values to each ES1 voltage

1. **Fine tune of D-magnets : unseparated beam, Ni target (Feb. 15)**
   *D2-D3 2D scan, D3->D4->D5 tuning (with narrow y) with "p"

2. **Fine tune of Q-magnets: unseparated beam? separated beam with ES1=±40 kV, Ni target (Feb. 15~Feb.17, Feb.21)**
   *Scan of Q1-Q8 currents, with "p"
   *Image of "p" at FF

3. **Fine tune of D4-D5 for "K^+" : unseparated/separated beam with ES1=±200 kV, Ni target (Feb.21)**
   *D4->D5 tuning (with narrow y) for "K^+"

4. **Fine tune of D-magnets for "pbar/K^-" : unseparated/separated beam with ES1=±40/200 kV, Ni target (Feb.21)**
   *D4->D5 tuning (with narrow y) for "K^-" (should be just confirmations)
   *D4->D5 tuning (with narrow y) for "$pbar^-$" (should be just confirmations)

5. **Momentum analysis by D5 (+0.75 GeV/c) : unseparated/separated beam with ES1=±40/200 kV, Ni target (Feb.21)**
   *condition1: Trigger: "p-TOF"/fp+ "e"/fe + "PA×T0"/999 (unseparated) under K-tuned D5
   *condition2: Trigger: "PA×T0"/f (K-tune) under K-tuned (**±200 kV**) beamline and K-tuned D5
   *condition3: Trigger: "PA×T0"/f (p-tune) under p-tuned (**±40 kV**) beamline and K-tuned D5

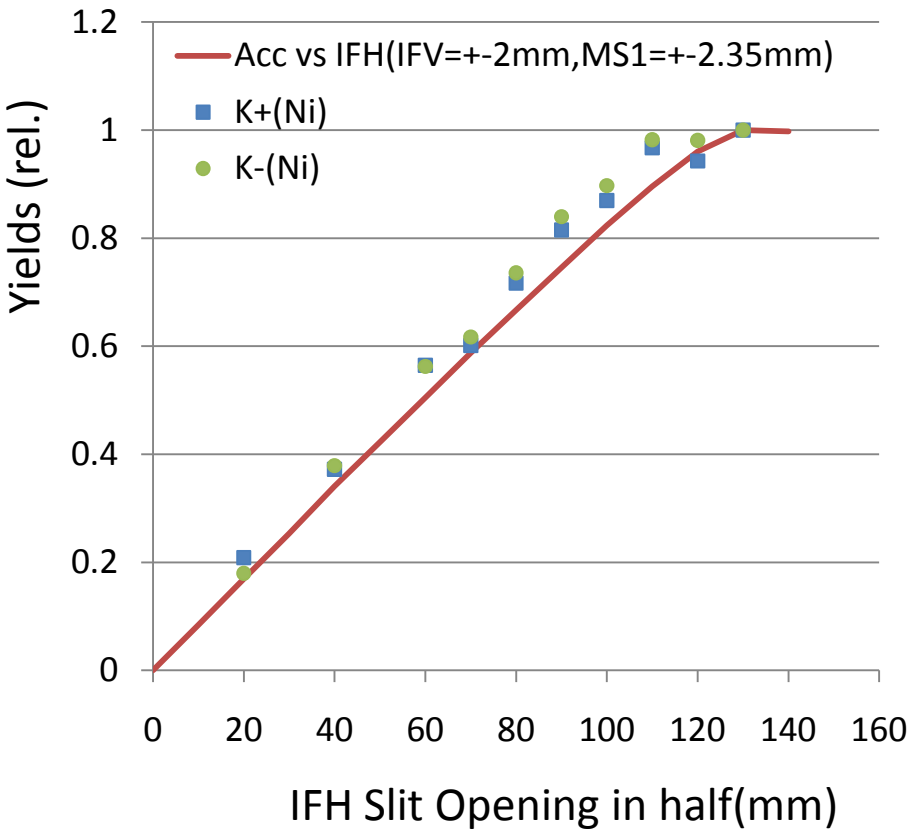
6. **Momentum analysis by D5 (-0.75 GeV/c)) : unseparated/separated beam with ES1=±40/200 kV, Ni target (Feb.21)**
   *condition1: Trigger: "p-TOF"+ "e"/fe + "PA×T0"/999 (unseparated) under K-tuned D5
   *condition2: Trigger: "PA×T0"/f (K-tune) under K-tuned (**±200 kV**) beamline and K-tuned D5
   *condition3: Trigger: "PA×T0"/f (pbar-tune) under p-tuned (**±40 kV**) beamline and K-tuned D5

Feb 14, 2010 by HN

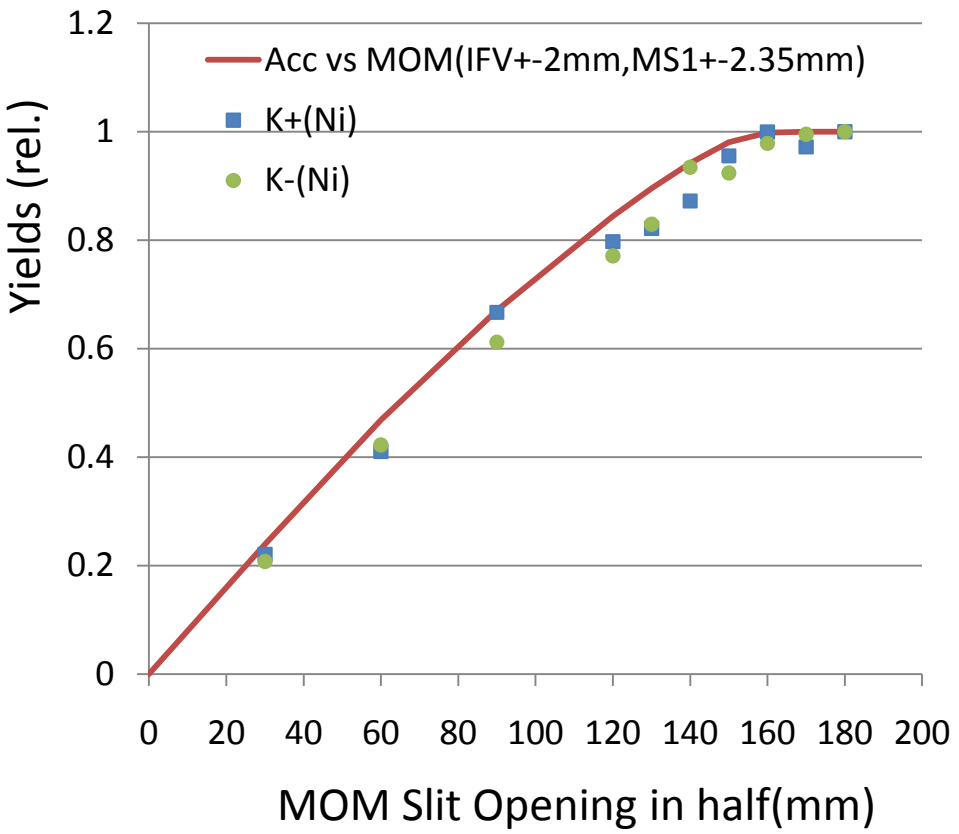
Slit Study

based on SlitStudy.xls and SlitStudy2.xls taken Jan. 19-22,2010.

測定1（IFH Slit Opening at IFV=+-2mm, MOM=+-180mm, and MS1=+-2.35mm)



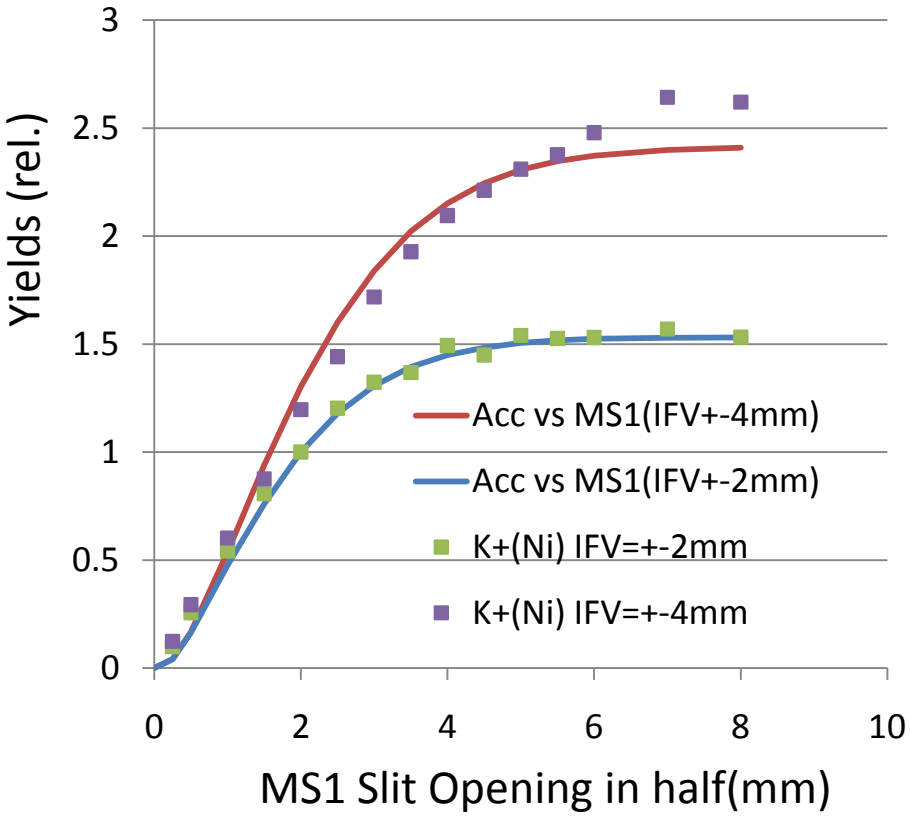
測定2（MOM Slit Opening at IFH=+-130mm, IFV=+-2mm, and MS1=+-2.35mm)

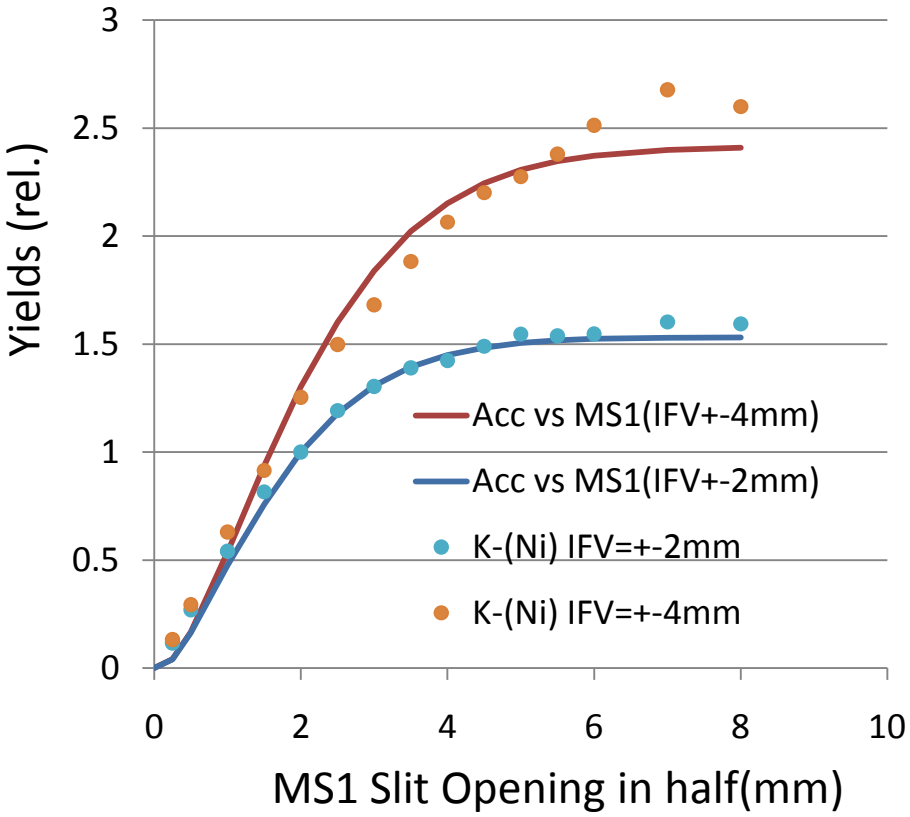


Curves are calculated for given slit openings by Turtle.

•Yields are normalized by that for IFH=+-130mm or MOM=+-180mm

測定３，４（Yields vs MS1 Opening for 2 IFV Opening, at IFH=+-130mm and MOM=+-180mm)

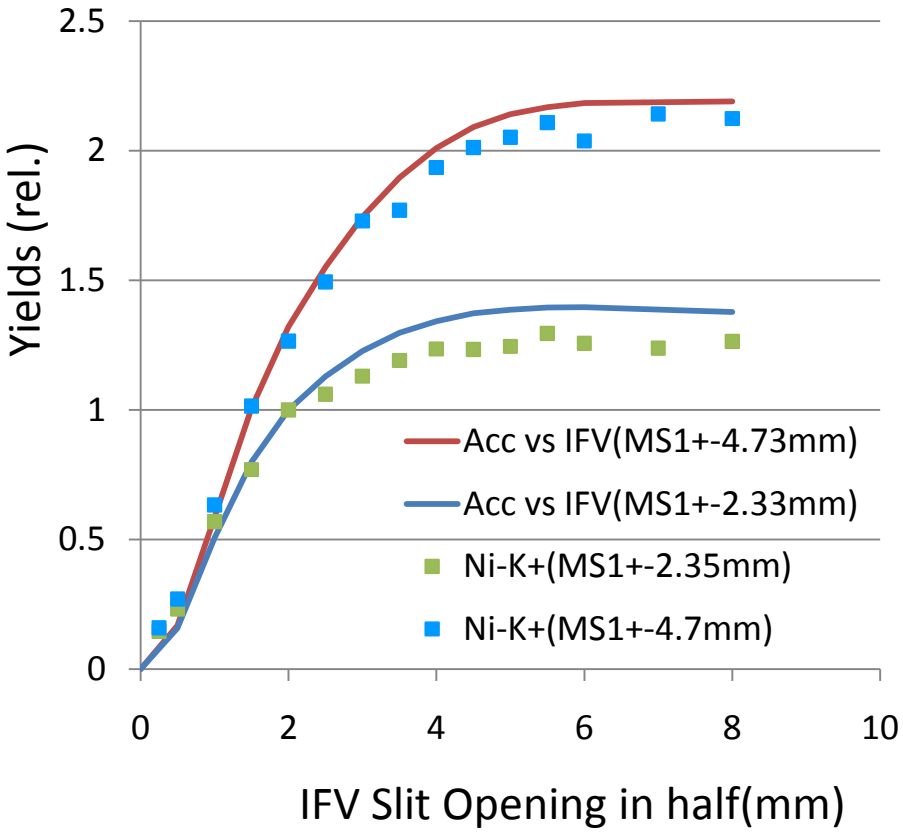


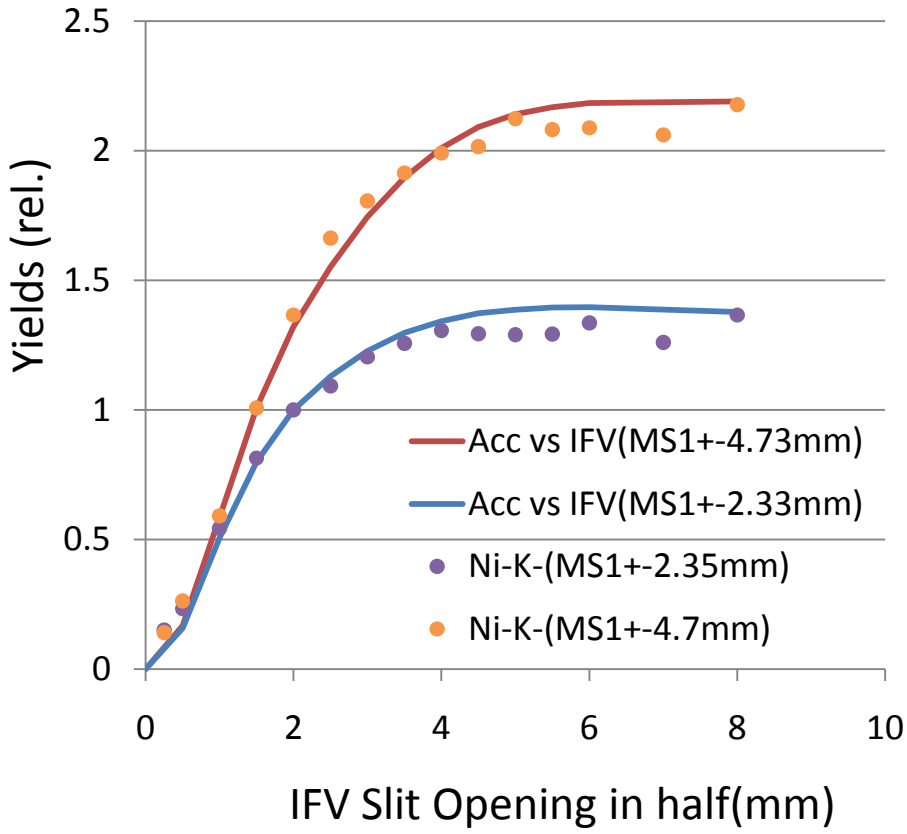


Curves are calculated for given slit openings by Turtle.

* Yields are normalized by that for MS1=+-2mm and IFV=+-2mm

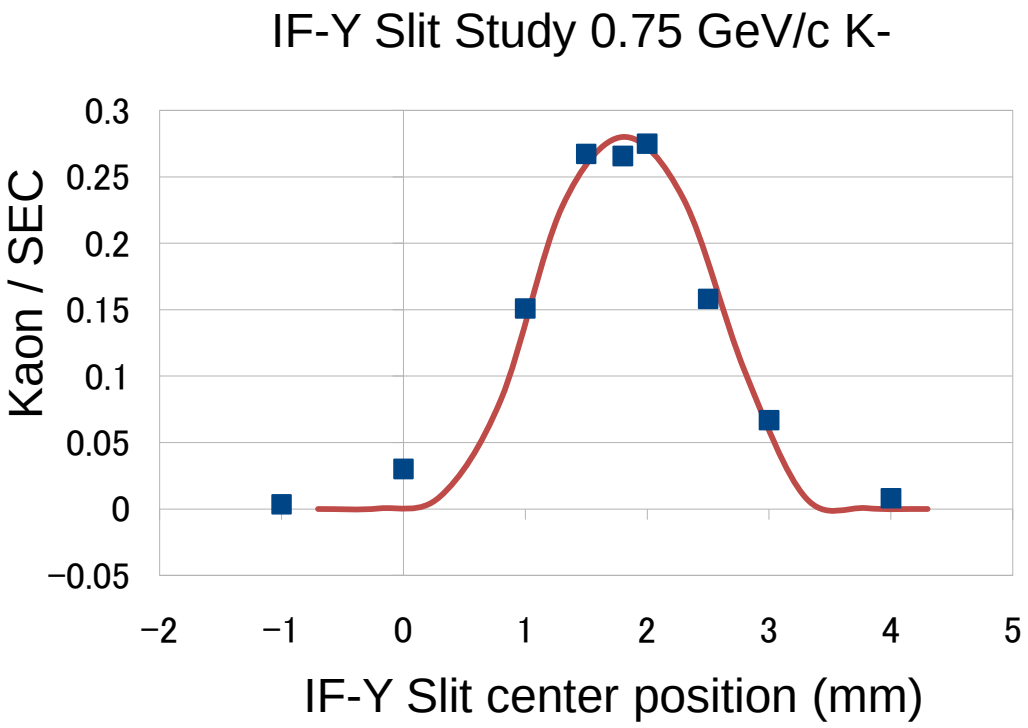
測定5,6（Yield vs IFV Slit Opening for 2 MS1 Opening, at IFH=+-130mm and MOM=+-180mm)





Curves are calculated for given slit openings by Turtle.

•Yields are normalized by that for IFV=+-2mm and MS1=+-2.35mm


IF-Y Slit Study 0.75 GeV/c K-
Kaon / SEC
0.3
0.25
0.2
0.15
0.1
0.05
0
−0.05
−2
−1
0
1
2
3
4
5
IF-Y Slit center position (mm)

Summary

✓IFH(Meas. #1) and MOM(Meas. #2):
Accs. seem 1~2 cm narrower than those calculated by TURTLE.

✓Yields vs MS1 Opening (Meas. #3 and #4):
Measurement is in good agreement w/ cal. in case of IFV=+-2mm
The yield saturates at a bit wider MS1 in case of IFV=+-4mm.
→ The beam profile at MS1 seems a bit wider than expected one.

✓Yields vs IFV Opening(Meas. #5 and #6):
Measurements seem in good agreement w/ calculations.
But, the yield saturates at a bit narrower IFV.
→ Consistent w/ Meas. #3 and #4.

✓From IFV offset study:
A measured profile at IFV has a wider tail than expected one.