scraper placement before the 1. dipol after target



• 2 possible positions for placing a scraper device:

- \Rightarrow PIN diode: more far from dipol \Rightarrow "pessimistic", but already prepared
- \Rightarrow Pocket: near to dipol \Rightarrow slightly more optimistic, much more work to do

- complete scraping
 - \Rightarrow x = -3.5 cm
 - \Rightarrow y_{width} = 10 cm
- E threshold for xy map is above the backscattered events (panel 3 & 4)
- clear separation of (p,γ) peak
- the (p,γ) peak is slightly bigger in the simulation







scrape Ruth., but not pg

 \Rightarrow x = -3.5 cm

 \Rightarrow y_{width} = 4 cm

- no E truncation:
 - backscattered events at (p, γ) !

Laszlo Varga (GSI, Germany)

Rutherford

(p,g)

8 1 x [cm]

(p,g)

x [cm]

x [cm]



- scrape Ruth., but not pg
 - \Rightarrow x = -3.5 cm
 - \Rightarrow y_{width} = 4 cm
- E truncation:
 - clear separation

Rutherford

(p,g) beam

8 1 x [cm]

Rutherford

(p,g)

x [cm]

x [cm]





- scrape Ruth. and pg partly
 - $\Rightarrow x = -3.5 \text{ cm}$
 - \Rightarrow y_{width} = 1 cm
- E truncation: overlap in xy plane
 - ⇒ no separation



- minimal scraping pos.
 - $\Rightarrow x \approx -4 \text{ cm}$

$$\Rightarrow$$
 y_{width} = 2 cm

1

scraping far from dipol (PIN DIODE) y [cm] Rutherford 4 3 2 (p,g) beam SLIT -2 8 1 x [cm] xE - Far from dipol (PIN DIODE) 880 [MeV] Rutherford 875 870 DETECTOR (p.a) total 865 860 855 E truncation 850 845 840 835 830 x [cm] XY - Far from dipol (PIN DIODE) / [cm] (p.a) 4 Butherford 2 DETECTOR 6 - 5 - 4 - 3 - 2 - 1 0 1 x [cm]



- AME16, MASS16: 124Xe = 123.9059 u
- AME16, NUBASE16: 124Xe = 124.0540 u
- scrape Ruth., but not pg
 - \Rightarrow x = -3.5 cm
 - \Rightarrow y_{width} = 4 cm

- AME16, MASS16: 124Xe = 123.9059 u
- AME16, NUBASE16: 124Xe = 124.0540 u
- scrape Ruth., but not pg

$$\Rightarrow$$
 y_{width} = 4 cm

- positions remain the same
- (p,γ) peak increases, but in the exp. data it is smaller:

 $x \approx \emptyset 1.6 cm, y \approx \emptyset 2 cm$







- minimal scraping pos.
 - $\Rightarrow x \approx -4 \text{ cm}$

$$\Rightarrow$$
 y_{width} = 2 cm

109 In(p, γ)¹¹⁰Sn reaction at 5AMeV, nuclear mass

y [cm]

y [cm]



optimal scraping

 \Rightarrow x = -3.5 cm

$$\Rightarrow$$
 y_{width} = 4 cm

109 In(p, γ)¹¹⁰Sn reaction at 5AMeV, nuclear mass





scraping far from dipol (PIN DIODE)

- minimal scraping pos.
 - $\Rightarrow x = -4 \text{ cm}$
 - \Rightarrow y_{width} \approx 2 cm

91 Nb(p, γ)⁹²Mo reaction at 4.5AMeV, nuclear mass



- minimal scraping pos.
 - $\Rightarrow x \approx -5.5 \, \text{cm}$
 - \Rightarrow y_{width} \approx 2.6 cm

91 Nb(p, γ)⁹²Mo reaction at 4.5AMeV, nuclear mass

SLIT

/ [cm]

[MeV]

E_{total} P

y [cm]

-2

410 408

406

404

402

400

398 396

2

-6

-8

(p,q)

Rutherford

-10 -5



- scrape until $x = -\infty!$
 - size in x > 6cm for 91Nb at 4.5AMeV

-6

DETECTOR

$^{73}As(p,\gamma)^{74}Se$ reaction at 4AMeV, nuclear mass





-12-11-10 -9 -8 -7

minimal scraping pos.

- $\Rightarrow x \approx -7.5 \, \text{cm}$
- \Rightarrow y_{width} \approx 3 cm
- $\Rightarrow x_{width} > 7 \, cm$
- DANGER: (p,g) peak size increases!

-6 -5 -4 x [cm]