

Heavy Flavours at Gamma Options of THERA

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1. γp option

2. γA option

3. Fixed Target option

Subcp1(t) — "rediska"

(Turkic part of) The Gamma Working Group

I. Parameters and Design: A.K. Giftçi (AU)
(γ_P, γ_A) Ö. Yavaş (AU)
M. Yılmaz (GU)

Necessary formulae (γ -spectrum, $W_{\gamma P}$ etc):

A.K. Giftçi et al., NIM A 365 (1995) 312

R. Brinkmann et al., DESY 97-239 (1997).

recent parameters: A.K. Giftçi, S. Sultanov, Ö. Yavaş
EPAC 2000; hep-ex/0004013
 $\gamma\gamma$ 2000; hep-ex/0007009

Main problem — Laser beam:

FEL —
Optical Cavity ??
⋮

Similar to γe option of TESLA, for recent
situation see V. Telnov, hep-ex/0010033

II. Physics

a) γP

$$\gamma P \rightarrow \bar{c}c X, \bar{b}b X$$

O. Fakir (AU), M. Zilmar (GU)

$$\gamma P \rightarrow t X$$

" " "

$$\gamma P \rightarrow W X$$

S. Atağ (AU), İ. Tüde (AU)

$$\gamma P \rightarrow u^*(d^*) X$$

b) γA

c) FEL γA

$$A^* \rightarrow A \gamma$$

H. Korum (GU), A. Kuliev (IFAN)

A. Guliyev (IFAN), Ö. Yavaş (AU)

d) TESLA $\gamma - N^{\uparrow\downarrow}$

$$\gamma^{\uparrow\downarrow} N^{\uparrow\downarrow} \rightarrow \bar{c}c X \quad A. Gelikel (AU), M. Kantar (AU)$$

AU — Ankara University

GU — Gazi University, Ankara

IFAN — Institute of Physics, Baku, Azerbaijan

Heavy Quarks at Gamma Options of THERA (summary)

$$\gamma p: X_g \approx \frac{5 \cdot m_c^2(G)}{0.8 \cdot S_{ep}} \quad , \quad "Q^2" \approx \mathcal{O}(m_c^2(G))$$

$\gamma p \rightarrow$	$\bar{c}c X$	$\bar{b}b X$	$\bar{t}t X$
X_g	10^{-5}	10^{-4}	0.04
N/year	$10^7 \div 10^8?$	$10^6 \div 10^7?$	$10^2 \div 10^3$

See talk given by L. Gladilin

$$\gamma p \rightarrow \gamma A: X_g \rightarrow \frac{A}{Z} X_g \quad , \quad N \rightarrow \frac{1}{10} N$$

$$\gamma p \rightarrow t X$$

$$\begin{cases} \gamma u \rightarrow t \rightarrow W^+ B \\ \gamma c \rightarrow t \rightarrow W^+ B \\ \gamma \bar{c} \rightarrow \bar{t} \rightarrow W^- \bar{B} \end{cases}$$

$$\gamma d(s) \rightarrow B \quad ??$$

$$f.t. \quad \gamma^{\uparrow\downarrow} N^{\uparrow\downarrow} \rightarrow \bar{c}c X, \bar{b}b X$$

$$X_g: \quad 0.02 \quad 0.2$$

$$\frac{\Delta G}{G} \Big|_{\text{syst}} < 1\% ??$$

S.I. Alekhin et al. Eur. Phys. J. C 11 (1999) 301

$\gamma^{\uparrow\downarrow} p^{\uparrow\downarrow}$ collider option — unique tool for
gluon polarization