International Atomic Energy Agency

4-momentum transfer

WP 2008-24 (Action 29 – NRDC 2007)

http://www-nds.iaea.org/nrdc/nrdc_2008/working/wp2008-24.pdf

N. Otsuka

Action 29 – NRDC 2007

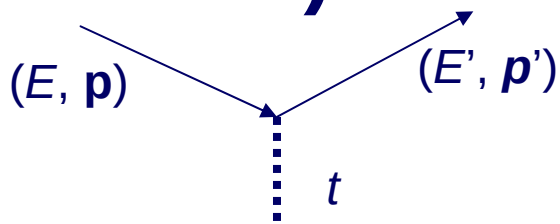
***A29 Otsuka* (not JCPRG)**

Review the quantities and units dimension for data differential with respect to 4-momentum transfer and submit a LEXFOR entry on it.

4-Momentum Transfer (*t*)

- **Coded as an independent variable under heading –t in EXFOR**

- $t = (E' - E)^2 - (p' - p)^2$ **(Lorentz scalar)**



- $t = -4\,p\,2\sin^2(\theta/2) < 0$ for elastic scatteirng

etc…

Back Ground of This Action

Clarification of dictionaries and LEXFOR.

Affected dictionaries:

- **24 (Data Headings, incl. plotting flag)**
- **25 (Units)**
- **26 (Family flag)**
- **32 (Parameters)**
- **213 (Reaction type)**
- **236 (Quantity)**

Dictionary (Memo CP-E/125)

Dictionary	Code	Dimension	Reaction type	CINDA quantity	Web quantity
24 (Data Headings)	-t	EC2			
25 (Units)	GEV2/C2	EC2			
	MB/GEV2/C2	D4			
26 (Family flag)	EC2 ,D4				
32 (Parameters)	DT				
213 (Reaction type)	DT			DT	DA
236 (Quantity)	,DT	D4	DT		

Implemented in dictionary TRANS.9096

LEXFOR Entries (Memo CP-E/125)

Secondary 4-momentum transfer distributions ($d\sigma/dt$)

Probability for a particle to be emitted with a given 4-momentum transfer squared t; given as $\sigma(t) = d\sigma/dt$, where 4-momentum transfer squared of the particle is defined by $t = (E'-E)^2 - (\vec{p}'-\vec{p})^2$ for scattering of the particle $(E, \vec{p}) \rightarrow (E', \vec{p}')$. Note that t is a Lorentz scalar, and $t = -4p^2 \sin^2(\theta/2) < 0$ for elastic scattering and $t = -4EE' \sin^2(\theta/2) < 0$ for relativistic limit. The data are given in units of cross section per unit of 4-momentum squared (*e.g.*, mb/(GeV/c)^2).

REACTION coding: `DT` in SF6.

Unit type: D4 (*e.g.*, `MB/GEV2/C2`)

The 4-momentum transfer squared is given under the data heading `-t` with the opposite sign.

Included in LEXFOR Feb, 2008 (O. Schwerer ed.)

END