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Memo CP-C/257

DATE: October 7, 1999
TO: Distribution
FROM: V. McLane
SUBJECT: 1) Dictionary updates
2) Polarization.

Please make the following updates to the Dictionaries.

Dictionary 3 (Institutes) Correction

1USANCA	Change city from Raleigh to Chapel Hill

Dictionary 31 (Branch) Additions

20	rank and projection (kq) for tensor analyzing powers
21	rank and projection (kq) for tensor analyzing powers)
22	rank and projection (kq) for tensor analyzing powers)

Dictionary 36 (Quantity) Additions

20,POL/DA,,TAP	T_{20} , tensor analyzing power, spherical coord.
20/PAR,POL/DA,,TAP	T_{20} , tensor analyzing power, spherical coord.,partl.
21,POL/DA,,TAP	T_{21} , tensor analyzing power, spherical coord.
22,POL/DA,,TAP	T_{22} , tensor analyzing power, spherical coord.
PAR,POL/DA,,SF	Spin flip probability for partial reaction.

Distribution

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Proposed LEXFOR entry

Updated LEXFOR entry for POLARIZATION, Spherical Coordinates

Quantities given in spherical coordinates

The following subscripts are defined:

k refers to rank

q refers to projection

The differential cross section for a reaction initiated by a beam with tensor components t_{kq} is given by

$$\sigma = \sigma_0 \left(\sum_{kq} t_{kq} T_{kq} * \right)$$

where σ_0 is the cross section for unpolarized particles.

The definitions given, following, refer to spin-1 particles.

If parity is conserved, $T_{10} = 0$, T_{11} = pure imaginary, and T_{2q} = pure real. The cross section may be written as

$$\sigma = \sigma_0 \left[1 + 2iT_{11} \operatorname{Re}(it_{11}) + T_{20} t_{20} + 2T_{21} \operatorname{Re}(t_{21}) + 2T_{22} \operatorname{Re}(t_{22}) \right]$$

Analyzing Power

Vector analyzing power, iT_{11}

REACTION coding: ,,POL/DA,,VAP

Tensor analyzing power

REACTION coding: T_{20}, 20,POL/DA,,TAP

T_{21}, 21,POL/DA,,TAP

T_{22}, 22,POL/DA,,TAP