Elementary Particle Approach to Some Nuclear Pion Reactions.

P. PASCUAL

CERN - Geneva

A. FUJII

*Institut de Physique Nucléaire - Orsay**(Nuovo Cimento, 65 A, 411 (1970))*

In the paper of ref. (3) a wrong value of $f\tau_{\frac{1}{2}}$ for ${}^6\text{He}$ was given. Due to this fact the results obtained in Sect. 7 of the present paper must be modified as follows:

... For the radiative pion capture we have $t = -1.7882 \cdot 10^{+4} (\text{MeV})^2$ and we obtain

$$(30) \quad F^{(0,1)}(t) = -(1.463 \pm 0.096) \cdot 10^{+4} \text{ MeV}.$$

Then we obtain

$$(31) \quad \Gamma(\pi^- \rightarrow \gamma) = (1.86 \pm 0.18) \cdot 10^{+15} \text{ s}.$$

There is not a direct measurement of this quantity. Nevertheless two important quantities have been measured: the pion disappearance width from the $1s$ orbit

$$(32) \quad \Gamma_{1s} = (0.15 \pm 0.05) \text{ keV }^{(11)}, \quad \Gamma_{1s} = (0.39 \pm 0.36) \text{ keV }^{(12)},$$

and the branching ratio to the radiative pion capture channel $^{(13)}$

$$(33) \quad R \equiv \frac{\Gamma[(\pi^- + {}^6\text{Li})_{1s,2s,2p,\dots} \rightarrow {}^6\text{He} + \gamma]}{\Gamma[(\pi^- + {}^6\text{Li})_{1s,2s,2p,\dots} \rightarrow \text{all}]} = 0.010 \pm 0.001.$$

If the pion-capture rate takes place totally from the $1s$ orbit we obtain from (32) and (33) the values

$$\Gamma[(\pi^- + {}^6\text{Li})_{1s} \rightarrow {}^6\text{He} + \gamma] = (2.3 \pm 0.8) \cdot 10^{+15} \text{ s}^{-1} \text{ }^{(11)}$$

and $(5.9 \pm 5.5) \cdot 10^{-15} \text{ s}^{-1} \text{ }^{(13)}$ which must be comparable with the value given in eq. (31). As we see the agreement is very good.