

### 1.3. Some properties of the charged $\Sigma$ hyperons\*

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A sample of some 7500  $K^-$  meson captures at rest on hydrogen in emulsion giving rise to charged  $\Sigma\pi$  pairs has been used to determine  $r$ , the decay branching ratio of the  $\Sigma^+$  hyperon,  $\gamma$ , the ratio of  $\Sigma^-$  to  $\Sigma^+$  hyperon productions,  $\tau_{\Sigma^-}$ , the lifetime of the  $\Sigma^-$  hyperon, and  $C$ , the mean orbital capture time of  $\Sigma^-$  hyperons in emulsion. The results were

$$r = \frac{\Sigma_{\Sigma^+} n + \pi^+}{\text{all } \Sigma^+ \text{ decay modes}} = 0.484 \pm 0.015,$$

$$\gamma = \frac{\Sigma^- \pi^+}{\Sigma^+ \pi^-} = 2.34 \pm 0.08, \quad \tau_{\Sigma^-} = (1.41 \begin{smallmatrix} +0.09 \\ -0.08 \end{smallmatrix}) \cdot 10^{-10} \text{s}, \text{ and } C < 10^{-12} \text{s}.$$

### 1.4. Fragmentation of light nuclei in nuclear emulsion induced by 1.5 GeV/c $K^-$ mesons

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The interaction of  $K^-$  mesons with heavy and light emulsion nuclei has been investigated in nuclear emulsion exposed to 1.5 GeV/c  $K^-$  mesons. The probability of interaction of  $K^-$  mesons with heavy and light nuclei is determined and compared to  $S$  values obtained by means of the optical model of interaction. An analysis is made of events of interaction on light nuclei in respect to the amount, mass and charge of emitted fragments and the excitation energy of the decaying residual nucleus. In particular, interactions leading to the emission of a hypernucleus are studied. The probability is determined of the emission of a hypernucleus in the interaction of 1.5 GeV/c  $K^-$  mesons with light emulsion nuclei, and the mechanism is discussed by which the hypernucleus emission takes place.

\*Work published in *Nuclear Physics B33* (1971) 493—504.