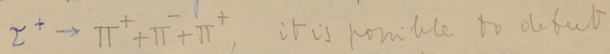


Detection of Σ

If the Σ meson decays into 3π , as



it is possible to detect the ~~stopping of the~~ Σ^+ , when it stops in matter, electronically. The frequency of the events will be ~~low~~, in a big scintillation counter in which the Σ stops:

- a) "Time 0": Pulse due to stopping of Σ , kinetic energy of π^+ 's, may be star due to negative π .
- b) Time within few 10^{-8} sec: 2 independent pulses due to the π - μ decay
- c) Time within few μ s: 2 independent pulses due to the μ - e decay.

The two pulses delayed few 10^{-8} can be photographed, while the two e decay can be detected electronically.

It is necessary a fast oscilloscope.

Σ^+

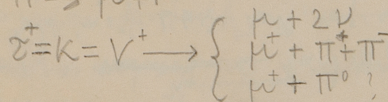
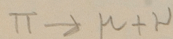
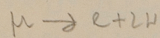
Centro Dipartimentale B. Pontecorvo

On the transformations of mesons

The Σ meson has a long life $\approx 10^{-8}$ sec, and is supposed to decay into $\pi^+ + \pi^0 + \pi^+$. If this is so, it must be concluded that Σ does not interact with nuclei, because, if the Σ interacts with nuclei, then the rate of the ~~reaction~~ ^{disintegration} would be very fast. (through the interaction with nucleons of the vacuum). Let us suppose that it does not interact strongly. Since it is strongly produced, it must produced as a decay product of a strongly interacting meson. But this then would decay into π quicker than Σ . So there is a contradiction between the presence of a strong interacting particle, and its long lifetime. This contradiction, of course, is resolved if the strongly ^{interacting} particle is produced in pairs. So from the very fact that a) Σ mesons have a long life, it can be concluded b) that they are present in abundance, we can conclude that there are mesons (not necessarily Σ mesons) which are strongly produced in pairs.

Incidentally, this contradiction explains in fact that with increasing energy

A consistent picture until now would be:



globally no other mesons that π mesons have been produced.

~~the statistics~~

