FIZIKA, Suppl. 1 (1969)

A. SOME TOPICS RELATED TO NUCLEAR PHYSICS

A 1 Study of Nuclear Structure with π Mesons

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A 2 Some Rules in High Energy Physics

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A 3 Parity Nonconserving Potentials

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The parity nonconserving nuclear potential (PNCP) emerging from the product of two strangeness conserving hadronic currents, is a logical, although not a necessary extension[1,2] of the standard description of nonleptonic decays of baryons. It has been suggested that PNCP can be used as a probe in the structure of weak Lagrangians, which is otherwise inaccessible.[3] Extensive calculations have been made recently concerning contributions to PNCP due to pion and vector meson exchange. Pion exchange has been calculated using either current algebra combined with SU(3) symmetry[4,5] or SU(3) symmetry alone.[6] Both approaches lead to essentially the same result:

$$V_\pi = \frac{G_\omega g}{2M}(\vec{\sigma}_1 + \vec{\sigma}_2)[\vec{p}_{21}, f(r)]_-(\tau_{1+}\tau_{2-} - \tau_{1-}\tau_{2+})\eta;$$

$$G_\omega = 1.92 \cdot 10^{-7}, \quad \frac{g^2}{4\pi} = 14.4,$$

$$f(r) = \frac{1}{4\pi}\frac{e^{-m_\pi r}}{r}.$$

Here the factor η depends on a particular weak interaction Lagrangian model.