scheme, $\pi^0$ or $\rho^0$ mesons are emitted in the first case, and $\pi_1$ or $\pi_2$ mesons in the second case.

Obviously, this situation is entirely similar to that arising for neutral K mesons.[8]

In conclusion the author expresses his deep gratitude to V. V. Chavchanidze for his guidance.

Note added in proof (June 15, 1958): If we take, for example, $m_{\pi^+} \sim (\pi^+)^* Q\pi^+$, where Q is some "mass" operator, one can roughly estimate the mass of $\rho^0$ as $\sim 139$ Mev, using formulas (1) to (3). Hence, the investigation of $\pi^0$ production processes appears to be the most convenient way to discover the $\rho^0$ meson (cf. Fliagin, Dzhelepov, Kiselev, and Oganesian, Preprint R-188 Joint Inst. for Nucl. Prob.).

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## *SIMPLE MAGNETOACOUSTIC WAVES*

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In ordinary hydrodynamics, it is shown[1] that points of high density in a simple wave move more rapidly than points with low density, if the inequality

$$\left(\frac{\partial^2}{\partial p^2}\frac{1}{\rho}\right) > 0 \qquad (1)$$

is satisfied.

In magnetic hydrodynamics, three types of simple waves are present:[2] fast and slow magneto-acoustic, and Alfven (magnetohydrodynamic) waves. The latter wave type is characterized by a constant density and constant velocity. As regards the first two types of waves, it can be shown that points of high density in them are displaced with higher velocity if condition (1) is satisfied.

It follows from this, in particular, that self-similar waves are always waves of discontinuity. The dependence of the phase velocity on the density leads, just as in ordinary hydrodynamics, to the result that in regions of compression the liquid continues to be compressed as long as a shock wave is not formed.

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## *IMPOSSIBILITY OF RAREFACTION SHOCK WAVES IN MAGNETOHYDRODYNAMICS*

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As is known,[1] according to Zemplen's theorem in hydrodynamics, rarefaction shock waves are impossible if

$$\left(\frac{\partial^2}{\partial p^2}\frac{1}{\rho}\right)_s > 0 \qquad (1)$$

Landau and Lifshitz[2] have shown that in magneto-hydrodynamic low-amplitude shock waves are compression waves if conditions (1) are satisfied.

Hoffmann and Teller[3] have shown that in an ideal gas the compressed shock wave is thermodynamic-