pairs can be produced upon collisions of primary protons [1, 2].

Groups of μ mesons with $E_\mu \sim 10^{13} - 10^{14}$ can thus be produced in the atmosphere, in a very narrow cone, from primary protons with energies $\sim 10^{14} - 10^{15}$ eV. A somewhat different situation is produced if the ν_μ neutrino, like the muon, carries g-charge. Then, apparently, the ν_μ neutrino should have a nonzero rest mass, and should carry additional energy losses for the formation, say, of muon pairs.

The possible existence of a relatively penetrating component in cosmic rays makes ambiguous the interpretation of the results of underground neutrino experiments. It is desirable to eliminate this ambiguity.

Certain experiments are being carried out in South Africa and India [4] at somewhat different depths (8800 and 7500 m w. e.), so that the count of the events may also be different, owing to some absorption of the possible additional neutral component. Entirely different results would be obtained if the entire planet were to be used as a "shield" [5]. For concrete numerical deductions, however, further and more detailed estimates are necessary.

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1) Since we consider the situation within the framework of the experimental feasibility of observing such interactions, we are justified to some extent in disregarding for the time being the divergences which are unexplained in the nonrenormalizable theories.

2) An entirely different situation will arise if more refined neutrino experiments with accelerators reduce the upper limit of g^2 by one or two roders of magnitude. In this case $\mathcal{P}$ will be only of theoretical interest (for $E_\mu \sim 10^{14}$ eV), from the point of view of the mass difference between the electron and the muon.

EXPERIMENTAL DETERMINATION OF THE SPEED OF SOUND IN THE CRITICAL REGION OF CARBON DIOXIDE

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The published experimental data on the speed of sound near the critical point of carbon dioxide are rather contradictory. We have carried out systematic measurements of the speed of sound in the critical region of CO_2. The measurements were made at 500 cps with the apparatus described in [1,2]. The results of measurements along four isotherms, including the critical

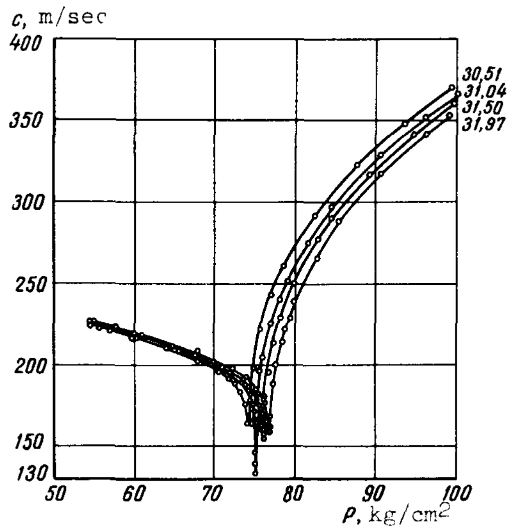

Fig. 1

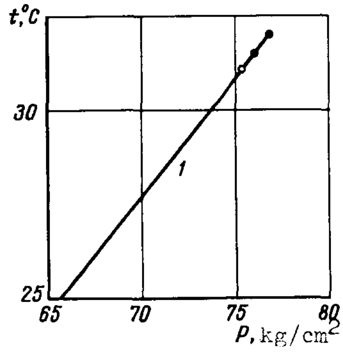

Fig. 2. Liquid-vapor phase equilibrium curve. o - critical point, o - points of minimum speed of sound on the isotherms t = 31.50 and 31.97°C.

one, are shown in Fig. 1. The isotherms of the speed of sound have a sharp minimum near the critical point. The lowest error in the speed of sound, equal to 0.25%, is observed at the ends of the isotherms. On approaching the minima of the speed of sound, the error rises and reaches 1%.

It is of interest to compare the results of our measurements in the vicinity of the critical point with the data obtained in [3-5]. Account must be taken here of the influence of both dispersion and the contamination of CO_2 on the measurement results. The difference in the values of the speed in the direct vicinity of the critical point can be explained primarily as being due to the different degree of contamination of the carbon dioxide used in the measurements. Thus, the values obtained for CO_2 were 140 m/sec [3], 150 m/sec [4], and 141.6 m/sec [5]. The smallest value of the speed of sound recorded by us is 132 m/sec.

In processing the measurement results we have found that the points of the sound-speed minima on the isotherms plotted in temperature/pressure coordinates (Fig. 2) lie on a line which is the continuation of the liquid-vapor phase-equilibirium curve.

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