noted here that if the figure obtained by the Canadian group (t = 0.72) were correct, we should obtain N(90°)/N(0°) = 2.

Thus, it follows from our measurements that the coefficient of spin mixing turns out to be the same, within the limits of experimental error, for the reactions $P^{31}(p, \alpha)Si^{28}$, $P^{31}(p, p)P^{31}$, and $P^{31}(p, \gamma_0)S^{32}$.

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RECONSTRUCTION OF NN POTENTIALS FROM NUCLEAR DATA

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We determined the parameters of the central NN potentials from the binding energies and the radii of nuclei that are more or less uniformly distributed over the entire periodic table: He^4, O^{16}, Ca^{40}, Zr^{92}, Yb^{176}, and Pu^{244}. The calculation was made in the fundamental approximation of the K-harmonics method [1] using the technique of [2]. The NN potentials in states with specified spin and isospin of the two nucleons S and T were chosen in the form of a superposition of two Gaussian potentials

$$V_{2S+1,2T+1}(r) = \sum_{i=1,2} V^{(i)}_{2S+1,2T+1} \exp\{-(r/r^{(i)}_{2S+1,2T+1})^2\}.$$

The potentials enter in the calculation of the nuclei in question in combinations of the type $V_{1,3} + V_{3,1}$ and $9V_{3,3} + V_{1,1}$. In this connection, we can put without loss of generality $V_{1,3} = V_{3,1}$ and $V_{3,3} = V_{1,1}$. The Coulomb interaction of the protons was taken into account exactly.

For the potentials $V_{3,1} = V_{1,3}$ we were able to find a "small island" of parameters near $V^{(1)}_{3,1} = -61.2$ MeV, $\tau^{(1)}_{3,1} = 2.05$ F and $V^{(2)}_{3,1} = 120$ MeV, $\tau^{(2)}_{3,1} = 0.95$ F.

All the succeeding investigations were carried out for such $V_{3,1} = V_{1,3}$.

The best results were obtained for $V^{(2)}_{3,3} = 0$, $V^{(1)}_{3,3} = 65$ MeV, $\tau^{(1)}_{3,3} = 1.5$ F and $V^{(2)}_{3,3} = 0$, $V^{(1)}_{3,3} = 12$ MeV, $\tau^{(1)}_{3,3} = 2.5$ F. These correspond to curves II and III of Fig. 1, respectively.

Curve I corresponds to the experimental data and curve V to the results for the Volkov potential [3], which lead to collapse starting already with Ca^{40}.

To investigate the problem of saturation of the nuclear forces, we investigated the dependence of the binding energy and the nuclear radii on $V_{3,3}$. The results are shown in Fig. 2. The points of curve I and the region to the left of it lead to collapse. The region between curves I and II is the region of transition from collapse to acceptable values of the radii and binding energies

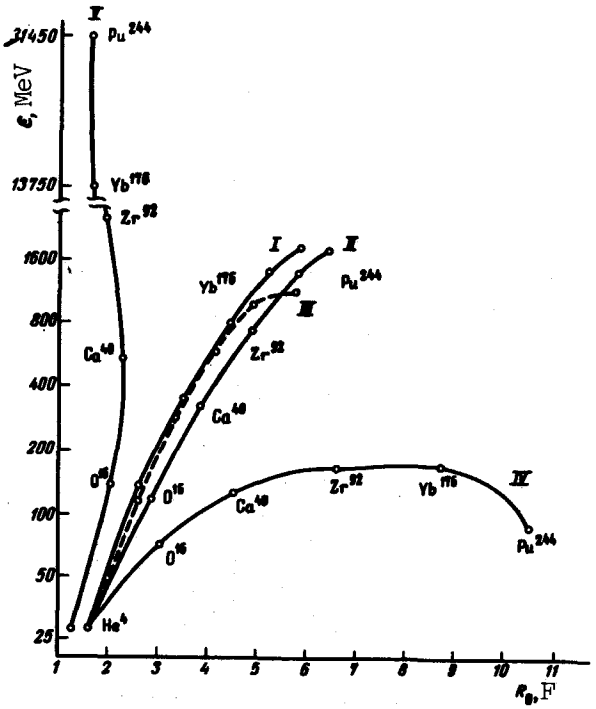

Fig. 1. Binding energy of nucleus ε vs. mean-square radius of the nucleus R_0; I - experiment, II - V - calculation.

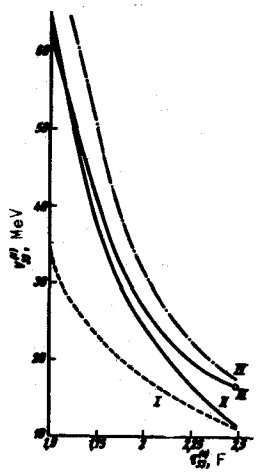

Fig. 2. Boundaries of saturation of nuclear forces.

of the nuclei. The best results are obtained for points in the region of curve II. Curve IV is the limit of collapse, obtained from the Calogero and Simonov [4] strongest condition for saturation of nuclear matter, in which no account is taken of the Coulomb interaction. Allowance for the Coulomb interaction shifts the collapse boundary IV appreciably towards curve III.

It is important to note that the potential $V_{3,3}$ from the region of saturation of nuclear matter (it is limited from below by curve III of Fig. 2) leads to a "disintegration" of the nuclei, as is seen, for example, on curve IV of Fig. 1. This curve was obtained from the parameters $V_{3,3}$ lying on the collapse boundary III (Fig. 2).

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ELECTRONIC MECHANICS OF CHANGING THE PHOTON THERMAL CONDUCTIVITY OF PIEZOSEMICONDUCTORS

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It is known that at an electron concentration less than 10^{19} cm^{-3} the main contribution to thermal conductivity is made by phonons [1]. In crystals with relatively large electron-phonon interaction, however, the electrons, in spite of their small concentration, can play an important role as before, since they