ELASTIC SCATTERING OF 13.6-Mev DEUTERONS BY NUCLEI. II

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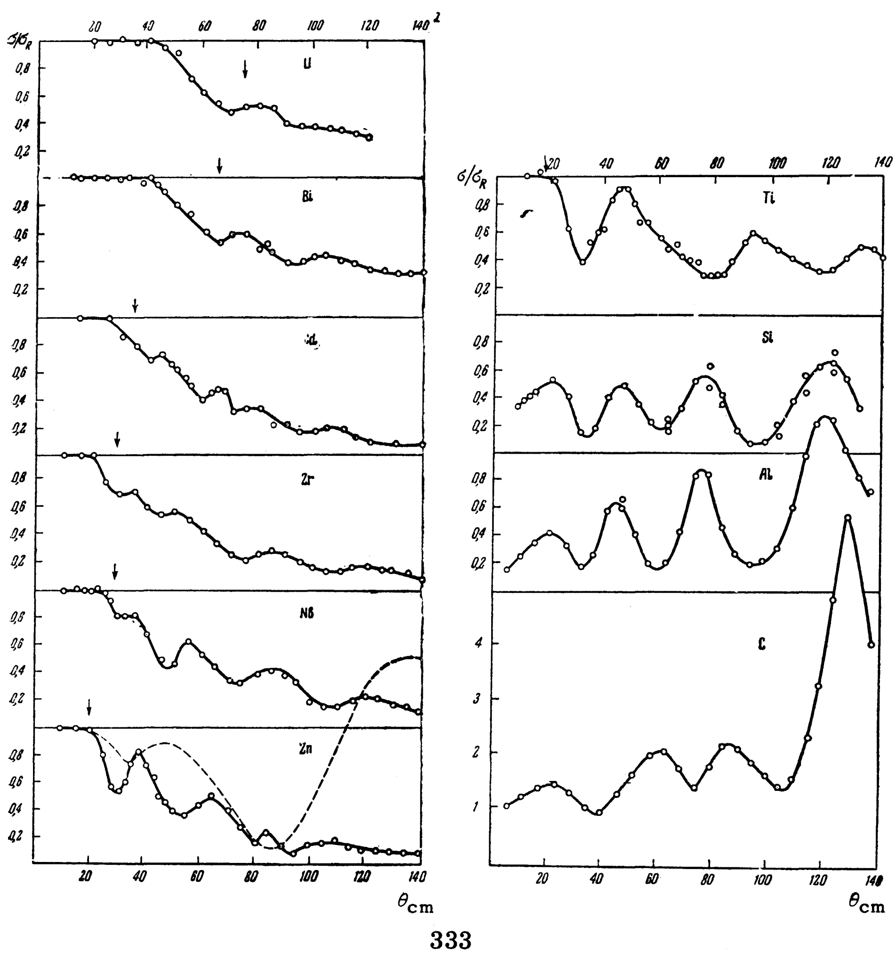
The angular distributions of 13.6-Mev deuterons elastically scattered on U, Bi, Cd, Zr, Nb, Zn, Ti, Si, Al and C nuclei are measured.

We measured the angular distributions of elastically-scattered deuterons on several nuclei using the extracted 13.6-Mev deuteron beam from the cyclotron of the Physics Institute of the Academy of Sciences of the Ukrainian S.S.R. The measurement procedure and the target-preparation technique were described earlier.[1,2] The half-width of the elastic peak amounted to 2.0 — 3.0 percent (at angles up to 90°). The statistical measurement errors did not exceed one percent. Since the deviations from Rutherford scattering take place in the case of aluminum, silicon, and carbon even at small angles, we measured the absolute cross sections of these nuclei for angles 45 and 55°.

The measurement results are shown in the figure. The arrows indicate the values of $\theta = \theta_{cr}$ at which nuclear interaction begins to come into play.

An attempt to compare the angular distribution for zinc with the optical model with rectangular well (dotted curve) yielded no agreement with experiment. For this curve we assumed the following parameters: $V_0 = -50$ Mev, $W_0 = -10$ Mev, $r_0 = 1.27 \times 10^{-13}$ cm. One might think that the introduction of a potential with rounded edge gives better results, since Melkanoff et al., using such a model, obtained satisfactory agreement with experiment for aluminum at $E_d = 15$ Mev in the angle range up to 100°.[3]



[1] N. I. Zaika and O. F. Nemets, Izv. Akad. Nauk SSSR, Ser. Fiz. **23**, 1460 (1959), Columbia Technical Translations p. 1447.

[2] Yu. V. Gofman and O. F. Nemets, JETP **39**, 1489 (1960), Soviet Phys. JETP **12**, 1035 (1961).

[3] M. A. Melkanoff, Proc. Int. Conf. on the Nucl. Optical Model, Florida State University, 1959, p. 207.

Translated by J. G. Adashko
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ERRATA

Vol	No	Author	page	col	line	Reads	Should read
13	2	Gofman and Nemets	333	r	Figure	Ordinates of angular distributions for Si, Al, and C should be doubled.	
13	2	Wang et al.	473	r	2nd Eq.	$\sigma_\mu = \frac{e^2f^2}{4\pi^3}\,\omega^2\,(\ln\frac{2\omega}{m_\mu} - 0.798)$	$\sigma_\mu = \frac{e^2f^2}{9\pi^3}\,\omega^2\left(\ln\frac{2\omega}{m_\mu} - \frac{55}{48}\right)$
			473	r	3rd Eq.	$(e^2f^2/4\pi^3)\,\omega^2 \geqslant \ldots$	$(e^2f^2/9\pi^3)\,\omega^2 \geqslant \ldots$
			473	r	17	242 Bev	292 Bev
14	1	Ivanter	178	r	9	1/73	1.58×10^{-6}
14	1	Laperashvili and Matinyan	196	r	4	statistical	static
14	2	Ustinova	418	r	Eq. (10) 4th line	$[-\frac{1}{4}(3\cos^2\theta - 1)\ldots$	$-[\frac{1}{4}(3\cos^2\theta - 1)\ldots$
14	3	Charakhchyan et al.	533	Table II, col. 6 line 1		1.9	0.9
14	3	Malakhov	550	The statement in the first two phrases following Eq. (5) are in error. Equation (5) is meaningful only when s is not too large compared with the threshold for inelastic processes. The last phrase of the abstract is therefore also in error.			
14	3	Kozhushner and Shabalin	677 ff		The right half of Eq. (7) should be multiplied by 2. Consequently, the expressions for the cross sections of processes (1) and (2) should be doubled.		
14	4	Nezlin	725	r	Fig. 6 is upside down, and the description "upward" in its caption should be "downward."		
14	4	Geĭlikman and Kresin	817	r	Eq. (1.5)	$\ldots\left[b^2\sum_{s=1}^{\infty}K_2(bs)\right]^2$	$\ldots\left[b^2\sum_{s=1}^{\infty}(-1)^{s+1}K_2(bs)\right]^2$
			817	r	Eq. (1.6)	$\Phi(T) = \ldots$	$\Phi(T) \approx \ldots$
			818	l	Fig. 6, ordinate axis	$\frac{\varkappa_s(T)}{\varkappa_n(T_c)}$	$\frac{\varkappa_s(T)}{\varkappa_n(T)}$
14	4	Ritus	918	r	4 from bottom	two or three	2.3
14	5	Yurasov and Sirotenko	971	l	Eq. (3)	1 < d/2 < 2	1 < d/r < 2
14	5	Shapiro	1154	l	Table	2306	23.6