Title
SUMMARY OF THE RESEARCH PROGRESS MEETING OF JULY 12, 1951

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Bonnie E. Cushman

August 29, 1951

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Diffraction Scattering of High Energy Protons - R. Richardson.

The elastic scattering of 340 Mev protons has been examined using the scattered deflected proton beam from the 184-inch cyclotron. The beam was taken out through the cave, collimated in order to obtain angular resolution and monitored with an ion chamber. The proton detector, a triple-coincidence scintillation counter telescope, was provided with copper shielding to keep out background; magnetic shielding was also used. A copper absorber was placed between the second and third scintillators so that only protons above 330 Mev were detected. Diffraction patterns from Pb, Cu, S, Al, and C were as predicted from the transparent nucleus theory (see graphs in UCRL 1284). The minima were sharpened by tilting the scattering arrangement since the beam comes out 13° to the horizontal, and an angular resolution of 1/5° was obtained. Smearing was greater in the lighter elements because of nuclear transparency. Experiments with pairs of elements with markedly different spins (W and Ta; Al, Mg and Si; Bi and Pb) indicated that the transparency effect is a function of atomic weight but not spin.

Specific Alpha Activity of U^{235} - E. Fleming.

Because of the large discrepancy in the value of the half life of U^{235} as determined by various investigators, a new measurement was carried out with highly enriched material from Oak Ridge. The uranium was placed on platinum discs for counting and it was found that the specific activity varied

with the sample thickness. However with a medium geometry counter (8.313 percent counting yield) back-scattering and self-absorption errors were made small enough to neglect and a value of $(7.07 \pm 0.11) \times 10^8$ years was obtained for the U^{235} half life. This corresponds to a value of 3.25×10^9 years for the age of the earth, based on a Pb-U ratio. See UCRL 1161 for details. The curve obtained from the pulse analysis is shown in Fig. 1

Recent Advances at Cavandish Laboratory - C. H. Wilkinson.

Dr. Wilkinson, a guest of the laboratory from Cambridge University, discussed the works at Cavandish Laboratory on instrumentation, describing several new kicksorters (pulse amplitude analyzers), and on energy levels of light nuclei. He also spoke of the current investigation in England of the mechanism of bird migration.

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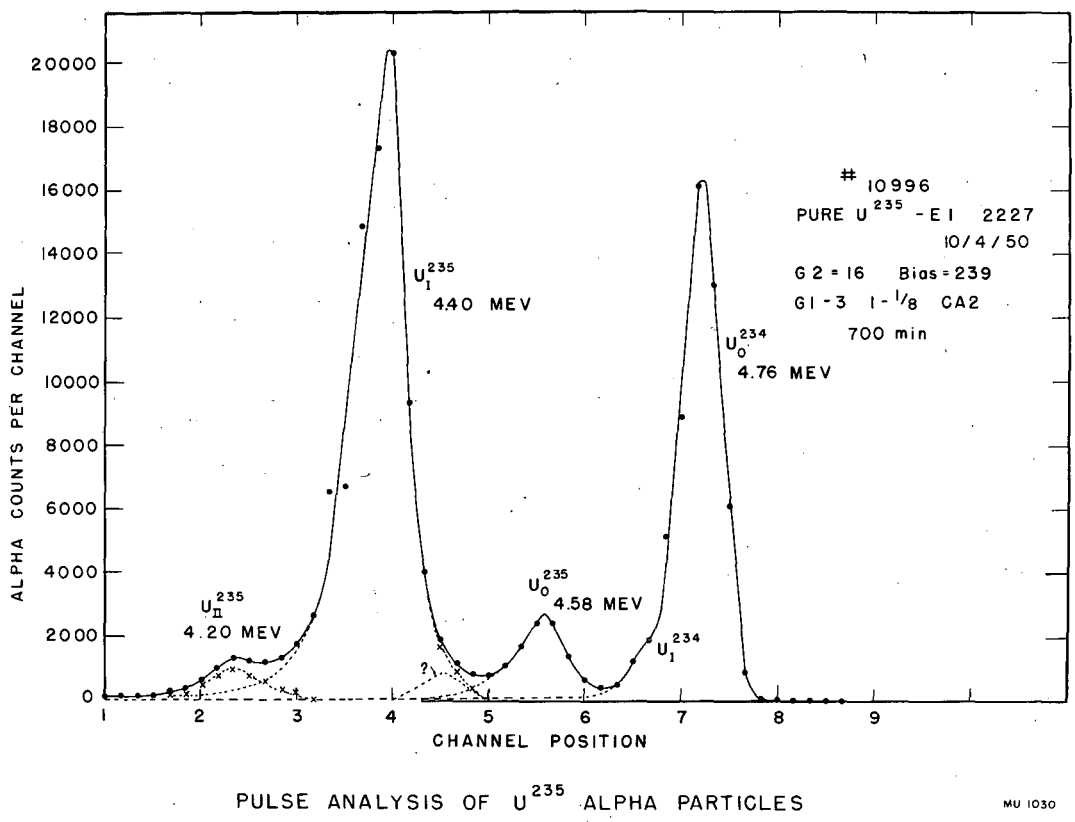
ALPHA COUNTS PER CHANNEL
CHANNEL POSITION
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
1
2
3
4
5
6
7
8
9
U_{II}^{235}
4.20 MEV
U_{I}^{235}
4.40 MEV
U_{0}^{235}
4.58 MEV
U_{1}^{234}
U_{0}^{234}
4.76 MEV
?
10996
PURE U^{235} - E I 2227
10/4/50
G 2 = 16 Bias = 239
G1 - 3 1 - 1/8 CA2
700 min
PULSE ANALYSIS OF U^{235} ALPHA PARTICLES
MU 1030

Fig. 1