analysis of the experimental angular distributions of elastic (π^-p) interactions at E > 1 Bev.‡

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*It was assumed here that, in the case of (πN) and (NN) collisions at E > 1 Bev, the cross section of diffraction ($\pi\pi$) scattering $\sigma^{d}_{\pi\pi} \simeq 1/3\sigma^{in}_{\pi\pi}$, where $\sigma^{in}_{\pi\pi}$ is the cross section of all inelastic ($\pi\pi$) interactions. Calculations have shown that the numbers in the table vary little with $\sigma^{d}_{\pi\pi}$.

†This question will be considered in detail in another paper.

‡Approximately half of the (π^-p) collisions occurs at impact parameters $\rho \gtrsim (0.5 \text{ to } 0.6) \times 10^{-13}$ cm, which can be explained only by assuming $r_\pi \sim r_N \sim 0.5 \times 10^{-13}$ cm, i.e. $\sigma_{\pi\pi} \sim 4\pi r_\pi^2 \sim \sigma_{\pi N}$ (see reference 5).

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DETECTION OF Eu^{++} *IONIZATION IN THE* SrS-Eu, Sm *PHOSPHOR BY THE PARAMAGNETIC ABSORPTION METHOD*

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IN the phosphor SrS-Eu, Sm (without flux) we discovered a decrease in the paramagnetic absorption of Eu^{++} upon excitation of this phosphor with light in the absorption band of Eu^{++} ($\lambda \sim 440$ mμ). This decrease was found to be dependent on the degree of the phosphor stimulation. At the moment of excitation the decrease of paramagnetic absorption is ~15%, and ~10 minutes after cessation of excitation this decrease amounts to ~8%. This agrees with the decrease in the self-absorption coefficient of Eu^{++} in phosphor during excitation. Measurements made some 10 — 20 minutes after cessation of excitation showed that the coefficient of activator absorption in the excited phosphor was less by ~11%. At the same time, measurements of the total number of quanta emitted by the excited phosphor were made starting 10 — 20 minutes after cessation of excitation. The measurements yielded 6.5×10^{15} quanta, proving that not less than 4% of the Eu^{++} became ionized. Assuming that the quantum yield of the radiation at recombination is ~½ and that the full amount of the activator was used for the formation of luminescence centers (Eu^{++}) we can state that about 8% of the Eu^{++} ions became ionized.

Thus, three independent methods gave compatible results. This allows us to state that ionization of the activator (Eu^{++} → Eu^{+++}) takes place upon excitation of the phosphor SrS-Eu, Sm.

The cause of the non-detection of ionization in the previous[1] work remains unclear. It is probably connected with the lower stability of the radiation spectroscope or with stray excitation of the luminophore in the resonator.

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SCATTERING OF A LOW-ENERGY ELECTRON BY A SHORT-RANGE POTENTIAL IN A STRONG MAGNETIC FIELD

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WE study the question of the scattering of an electron with energy E by a potential $V(\mathbf{r})$ in a homogeneous magnetic field **H**, assuming that the radius of action of the scattering potential