29607

AECU-315

~~AECU-315~~
AECU-315 ← This is correct
UCRL-360 Abstract

Production of Mesons by X-Rays. EDWIN M. McMILLAN AND JACK M. PETERSON. University of California, Radiation Laboratory, Berkeley, California--

The first experimental program to be undertaken with the Berkeley synchrotron is a study of meson production. The emergent beam of 335 Mev x-rays passes through a stack of nuclear plates (Ilford F-3), or through a slab of matter in the vicinity of such plates; then meson tracks in the emulsion are sought by microscopic examination. The results prove conclusively that mesons are produced, and that they are not the result of secondary heavy particles and most probably not the result of secondary electrons. A very rough estimate of the cross section for meson production by x-rays in glass is $3 \times 10^{-30} \text{ cm}^2$ per nucleon. The number of quanta is here defined as the total x-ray energy divided by the peak quantum energy. Since only mesons with energies below about 10 Mev will stop in the stack of plates and be counted, the actual cross section may be considerably larger.

Out of a total of 145 tracks recorded, 91 end in stars. Assuming that three quarters of all negative π mesons produce stars, and that every positive π meson is accompanied by a μ , this leads to a ratio negative π /positive $\pi \sim 10$. The actual $\pi \mu$ decay is not always discernible on these rather insensitive plates; only 5 cases have been seen. The statistics given above include mesons from both glass and carbon, and in both cases the excess of negatives is apparent.

The work described was performed under the auspices of the Atomic Energy Commission.

This document is
PUBLICLY RELEASABLE

Hugh Kinsed
Authorizing Official
Date: 12-28-70

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.