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Showers Initiated by 335 Mev Bremsstrahlung

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Showers Initiated by 335 Mev Bremsstrahlung. WADE BLOCKER AND ROBERT W. KENNEY. Radiation Laboratory, University of California, Berkeley, California.

The variation of cascade shower intensity with depth has been determined for showers produced in lead, copper, aluminum, and carbon by the 335 Mev bremsstrahlung from the Berkeley synchrotron.

The collimated beam from the synchrotron passed through a monitor ionization chamber and fell normally upon closely stacked plates of the element under study. The shower particles from various thicknesses of this element were then observed by a detector ionization chamber situated behind the plates. An essentially infinite amount of the element under study was placed behind the detector chamber to provide backscattered radiation. This contribution to the total intensity was very considerable in the case of lead.

Shower intensities in the initial half radiation length allow the thin layer pair production and Compton contributions to the shower to be derived. The ordinates and abscissae of the maxima of the shower curves are compared with theory. The exponential tails of the shower curves give the gamma ray absorption coefficients at the energy of minimum absorption cross-section. These values are compared with theory. A thin sheet of lead observed by an ionization chamber gave ionization values which are used to derive the total energy of the X-ray beam. This work was sponsored by the A.E.C.