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MESON MASS ESTIMATION BY GRAIN COUNTING IN PHOTOGRAPHIC EMULSIONS

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CLASSIFICATION CANCELLED BY AUTHORITY
OF THE DECLASSIFICATION COMMITTEE

Negative mesons produced by the 184-inch Berkeley cyclotron have been studied by means of Ilford C.2 photographic plates of emulsion thickness 50 μ . The meson tracks lie approximately parallel to the plane of the emulsion, and often end in the emulsion. The track grains are about 0.35 μ in diameter. For particles carrying one unit of charge, the number of grains, $N(R)$, in a residual range R is assumed to be given by $N(R) = M f(R/M)$, where M is the mass of the particle. By counting grains in meson tracks and proton tracks found in the same plate, the mass ratio of meson to proton can be found. A consistent convention for estimating the number of grains which occur in clumps reduces subjective errors. Comparisons of masses obtained by grain counting and by magnetic deflection on the same particle are made. Results of different observers are also related. Masses of star producing and non-star producing mesons are compared. This paper is based on work performed under contract W-7405-eng-48 with the Atomic Energy Commission in connection with the Radiation Laboratory, University of California, Berkeley, California.

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