

Abstract Submitted  
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**PPAC characteristics for unstable nuclear beams of intermediate energy II** KENICHI KARATSU — The parallel-plate avalanche counter (PPAC) is a detector that utilizes an ionization avalanche mechanism. We have constructed a model to explain the avalanche mechanism. Inside the PPAC, an electron is accelerated by a large electric field, which is present between the anode and cathode. Each time an electron travels its mean free path, colliding with a gas molecule, it loses all of its kinetic energy. With  $n(x)$  as the number of electrons at position  $x$ , there are a few among them that do not collide at all; collecting enough energy to ionize a gas molecule. The number of such electrons is  $n(x) \exp(-l/\lambda)$ . While these electrons advance by  $dx$ , it collides with a gas molecule by a probability of  $dx/\lambda$ ; liberating another electron. Therefore we obtain the relation

$$dn = n \exp(-l/\lambda) dx/\lambda$$

This yields a relation similar to the empirical rule. In order to discuss the adequacy of this model, we must compare the parameters included in both equations. This calls for further testing of the operation of the PPAC with different gases and bias voltages. The experiments are being done at the tandem accelerator at Kyoto University.

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