1. Topic
2. **Alpha** is electron collision ionization coefficient, which is the time of collision ionization happens when an electron passes 1cm through the electric field on average.

**Avalanche:** number of free electrons increase due to the collision ionization.

**Secondary electron avalanche:** after the positive and negative ion combine with each other, the photon will cause ionization on the negative electrode.

**Slightly non-uniform electric field:** the electric field non-uniformity factor is between 1 and 2.

**Measure alpha:**

在单对数坐标系中，relation between current and distance between electrodes d is linear. And the steepness of the line is alpha.

**Alpha is related to** the relevant air density and the electric field strength. (书上P19公式)

**SF6** is usually used in slightly non-uniform electric field. Because the electric strength of SF6 is much higher in slightly non-uniform field than that of the extremely non-uniform field.

1. **Polar effect of breakdown voltage**: under different space charge, the breakdown voltage will differ from each other.

**T**ake rod-plane as an example. When the rod is negative, the development of the streamer will be more difficult than the positive one, so the breakdown voltage of the negative one is higher.

**V-t characteristics**: the curve of the maximum value of voltage and the breakdown time of the gap.

**For impulse voltage,** the breakdown voltage of the gap is strongly related to the application time.

1. Polarization: under the electric field, the positive and negative particles moves along the direction of the field and generate dipole, or
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