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阴极形貌对表面传导电子源的影响

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摘要： 使用有限元方法分析表面传导电子源阴极的形貌对其阴极和栅极附近电场分布及在金属电极、真空与发射薄膜交界处电子发射轨迹的响。对不同阴极形貌下电子发射轨迹模拟结果表明,并非所有在金属电极、真空与发射薄膜三者交界处的电子都可以到达阳极板,阳极电压、阴高度和外形都会影响发射电子的轨迹从而影响阴极电子的发射效率,模拟发现降低电极高度、增大阳极电压、使用大半径的弧形电极可以提高子发射效率。

关键词： 表面传导电子源 电场分布 阴极电极形貌

Influence of Cathode Shape on Surface-Conduction Electrons Emitter

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Abstract: The influence of the cathode structure on the distribution of electric field near the cathode and grid, and th emission electron trajectories near the intersection of the cathode, film and vacuum is studied in surface-conduction electron emitter by the finite elements method. The results indicate that not all electrons emitted from the zone near the intersection can reach the anode through analyzing electron trajectories. The anode voltage, the cathode height and the cathode shape affect the position from which electrons emit and can reach the anode thereby affecting the efficiency of electron emission, simulation shows that reducing the electrode height, increasing anode voltage and applying arc electrode of large radius can increase electron emission.

Keywords: surface-conduction electrons source cathode shape distribution of electrical field electrons trajectorie

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