

研究简报

平面薄膜场致发射的模型分析

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摘要

该文系统地讨论宽带隙平面薄膜的场致电子发射(FEE)的机理。基本的理论模型是电子对表面势垒的隧穿效应,同时考虑到晶格的散射和薄膜势垒中微细贯穿通道的电子发射作用。分析结果表明,宽带隙平面薄膜结构用作场致电子发射阴极,具有发射电压的阈值低,发射电子的能量分布范围小等优点。另外这种结构制作简单、材料选择范围宽、理化稳定性好,是一种理想的场致发射电子源。

关键词 [薄膜](#) [场致发射](#) [模型](#)

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MODEL STUDY OF FEE FROM PLANAR FILMS

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Abstract

The mechanics of Field Electron Emission (FEE) from planar thin films of wide band-gap have been studied systematically. The basic model is the electron tunneling through the potential barriers at the interfaces, on the other hand the effect of scattering of the crystal lattice and the effect of micro conductive channel on FEE have been taken into consideration. The study result shows that the planar film structure is conformable for FEE cathode, because it has low voltage threshold and small range of energy distribution of the emitted electrons. Since the structure can be easily prepared, and its components are widely selectable, and its surface stability in mechanics and chemistry is outstanding, this structure is an ideal electron emitter.

Key words [Thin film](#) [Field emission](#) [Model](#)

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