Fowler-Nordheim field emission : effects in semiconductor nanostructures

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Abstrak

This monograph solely presents the Fowler-Nordheim field emission (FNFE) from semiconductors and their nanostructures. The materials considered are quantum confined non-linear optical, III-V, II-VI, Ge, Te, carbon nanotubes, PtSb2, stressed materials, Bismuth, GaP, Gallium Antimonide, II-V, Bi2Te3, III-V, II-VI, IV-VI and HgTe/CdTe superlattices with graded interfaces and effective mass superlattices under magnetic quantization and quantum wires of the aforementioned superlattices. The FNFE in opto-electronic materials and their quantum confined counterparts is studied in the presence of light waves and intense electric fields on the basis of newly formulated electron dispersion laws that control the studies of such quantum effect devices. The importance of band gap measurements in opto-electronic materials in the presence of external fields is discussed from this perspective. This monograph contains 200 open research problems.