[redacted]

II. THEORETICAL APPROACHES TO

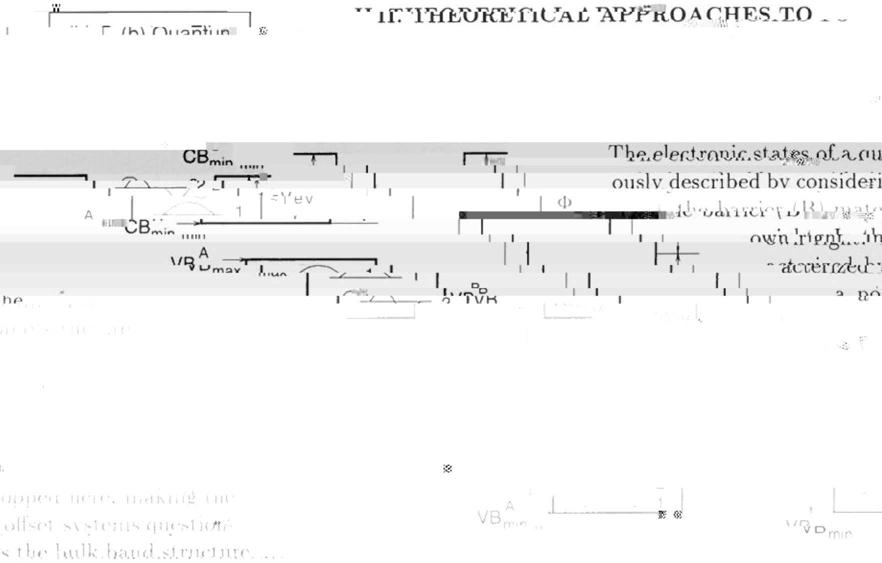


FIG. 1. Schematic depiction of qu...

The electronic states of a quantum well can be rigorously described by considering the barrier (B) and the well (W) material each as a (combined) solid in its own right. In this description, both B and W are characterized by periodic potentials in their interiors and a potential step at the interface between them.

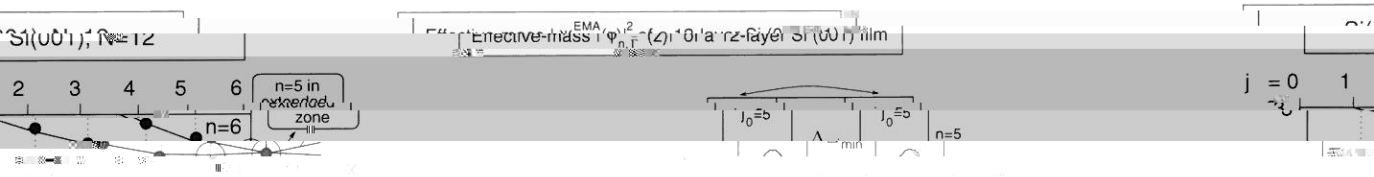
...to the unit cell size has been dropped here, making the application of the EMA to large offset systems questionable.) In doing so, one replaces the bulk band structure...

...energy continua. Energy levels and wavefunctions, indexed by quantum numbers ν_{EMA}, are...

...zone cen...

...rs and a is the bulk cubic lattice constant. The requirement that the wave function $\psi(\mathbf{r})$ will vanish at the boundaries leads to...

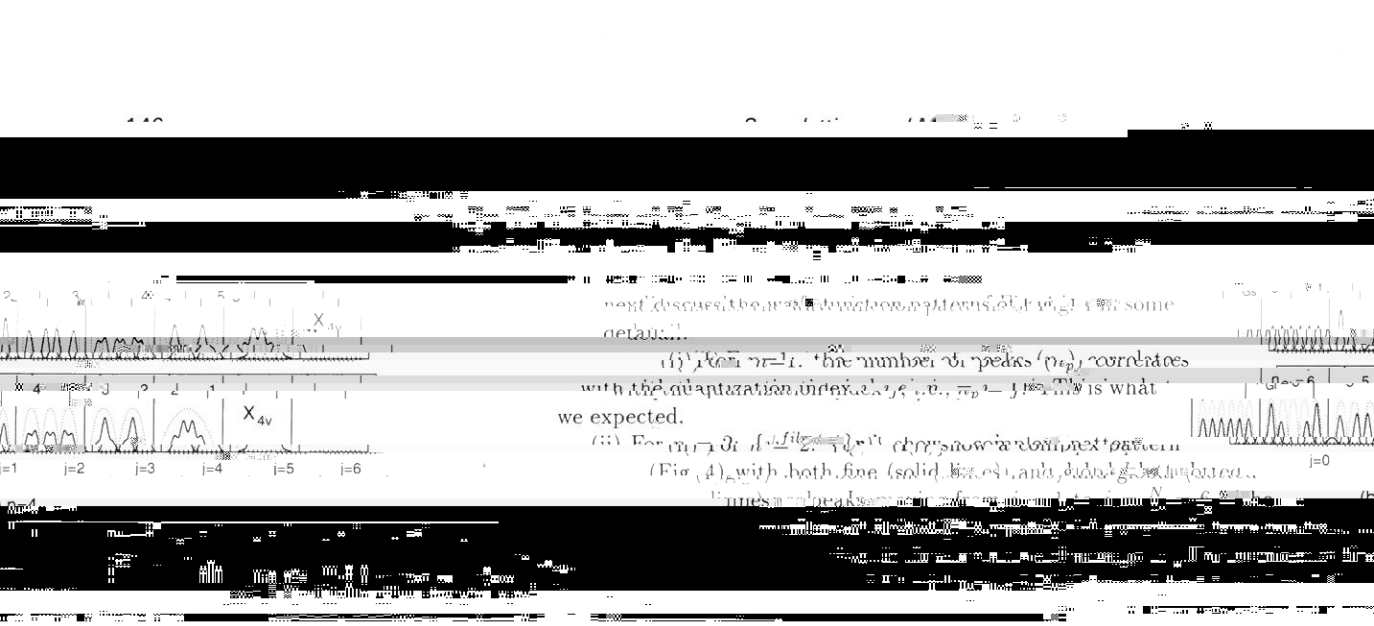
...we will see below that, in fact, unlike the quantum...


Si(001); N=12
2
3
4
5
6
n=5 in extended zone
n=6
Effective-mass Φ²n,Γ(z) in barrier-layer Si (001) film
j = 0
1
J0=5
J0=5
n=5
Δmin

is made that the solutions are valid only near band edges

approximation involved is the use of an empirical pseu-

(10)


X4v
j=1
j=2
j=3
j=4
j=5
j=6
j=0

the number of peaks of a film state and its quantum index (n, j) is found. The evolution of energy levels with film layer thickness is examined, revealing the inter-

REFERENCES

[1] G. Bastard, *Wave Mechanics in Physics of Semiconductor*