

# Energy Spectrum of Carriers in a Kane-type Semiconductor Anti-wire

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Z. Naturforsch. **60a**, 593 – 598 (2005); received March 29, 2005

The electronic states of a Kane-type semiconductor anti-wire with and without a magnetic field are theoretically investigated. The eigenvalues and eigenstates of Kane's Hamiltonian are obtained. The calculations are performed for a hard-wall confinement potential, and electronic states are obtained as functions of the magnetic field applied along the cylinder axis. The size dependences of the effective  $g$ -value in InSb for electrons and light holes are calculated. The effective  $g$ -values of the electrons and light holes decreased with decreasing anti-wire radius.

*Key words:* Nanostructures; Spin-orbital Coupling;  $g$ -Factor.