SPIN-POLARIZED SURFACE STATES IN SEMICONDUCTOR SUPERLATTICES

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Electronic surface states in $Al_{0.1}Ga_{0.9}As|GaAs$ superlattice are calculated for a system with a $ZnMnSe$ barrier in a surface cell. In the absence of applied magnetic field the $ZnMnSe$ barrier has the same height as the $Al_{0.1}Ga_{0.9}As$ barriers in the bulk cells. When a magnetic field is applied perpendicularly to the superlattice layers, the surface cell magnetic barrier height is found to vary with spin orientation. Hence, each spin polarization involves different conditions of surface state existence. Our computations show a split of Shockley states into two levels (corresponding to different spin polarizations) and appearance of Tamm states (with specific spin polarization), induced by sufficiently strong magnetic fields.

9.7 cm

13.4 cm

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