THE METHOD OF S-MATRIX IN THE THEORY OF RESONANCE ENERGIES AND WIDTHS FOR QUASISTATIONARY STATES OF AN ELECTRON IN ASYMMETRIC TWO-BARRIER RESONANCE-TUNNEL STRUCTURES

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S u m m a r y

By the methods of transfer- and S-matrices, we executed the analytic and numerical calculations of resonance energies and widths of quasistationary states of an electron in a plane two-barrier resonance-tunnel nanostructure with asymmetric rectangular (with different effective masses in barriers and wells) and δ-like potential barriers. By the example of the nanosystems GaAs/AlAs and $In_xAl_{1-x}As/In_xGa_{1-x}As$, we show that, as distinct from the exact values of resonance energies and widths in the model of rectangular potential barriers, the model of δ-like barriers which is often used in theoretical studies gives the errors of resonance energies overestimated by tens of percents, whereas the resonance widths are overestimated by tens of times.