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A numerical simulation study of inverse doped surface layer in Schottky barrier modification SUBHASH CHAND, PRIYANKA KAUSHAL, Department of Physics, National Institute of Technology, Hamirpur-177 005 (HP) — The Poisson's and continuity equations are solved by iterative method to obtain the potential and electron and hole concentrations inside the semiconductor near the metal semiconductor interface for different inverse layer thickness and doping concentrations. The barrier height (BH) and ideality factor (IF) obtained by fitting of simulated current voltage data into thermionic emission diffusion current equation. The derived BH increases with increase in inverse layer thickness as well as with increase in the inverse layer doing concentration and then saturates at maximum value. The IF first rises with increase in inverse layer thickness and then attaining a maximum value at a particular thickness it decreases approaching unity value for large inverse layer thickness. It is observed that for large inverse layer thickness the BH attains a maximum value with unity IF. Thus, there are two regimes, namely, non-ideal regime corresponding to less inverse layer thickness where the BH has increased less and IF is more than unity and ideal regime corresponding to large inverse layer thickness where the BH attains maximum value with unity IF.

Subhash Chand
Department of Physics, National Institute of Technology,
Hamirpur-177 005 (HP)

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