In this work we reported the Nonlinear Optical Rectification (NOR) as well as the Second and Third Harmonic Generation (SHG and THG) for an asymmetric double $\delta$-doped like potential profile in a GaAs matrix. In particular in this work we theoretically investigated, by means of the effective mass and parabolic band approximations, the effect of an $x$-directed magnetic field. In general it is found that the electron energy levels as the magnetic field goes from zero to 20 T increases, being the higher levels more affected than the ground and first excited state. This behaviour causes that the main energy level transition increases and produces a blue shift in the Nonlinear Optical Rectification as well a decrease in its amplitude as a magnetic field increase due to a dipole matrix element diminish as the magnetic field increases. By the other hand we reported a blue shift also for the second harmonic generation, the same behaviour hold for the third harmonic generation (THG) but it exhibits a well-defined THG peak for an incident photon energy of 39 meV for a 10 T applied magnetic field, that is in the THz range of operation.

**Keywords:** delta- doped, Nonlinear Optical Rectification, harmonic generation

**Presenting author's email:** jcmover@fisica.uaz.edu.mx