

Modeling Reflection and Transmission of Elastodiffusive Wave Sata Semiconductor Interface

Authors : Amit Sharma, J. N. Sharma

Abstract : This paper deals with the study of reflection and transmission characteristics of acoustic waves at the interface of a semiconductor halfspace and elastic solid. The amplitude ratios (reflection and transmission coefficients) of reflected and transmitted waves to that of incident wave varying with the incident angles have been examined for the case of quasi-longitudinal wave. The special cases of normal and grazing incidence have also been derived with the help of Gauss elimination method. The mathematical model consisting of governing partial differential equations of motion and charge carriers diffusion of n-type semiconductors and elastic solid has been solved both analytically and numerically in the study. The numerical computations of reflection and transmission coefficients has been carried out by using MATLAB programming software for silicon (Si) semiconductor and copper elastic solid. The computer simulated results have been plotted graphically for Si semiconductors. The study may be useful in semiconductors, geology, and seismology in addition to surface acoustic wave (SAW) devices.

Keywords : quasilongitudinal, reflection and transmission, semiconductors, acoustics

Conference Title : ICMMMAS 2014 : International Conference on Mathematical Models and Methods in Applied Sciences

Conference Location : Venice, Italy

Conference Dates : November 14-15, 2014