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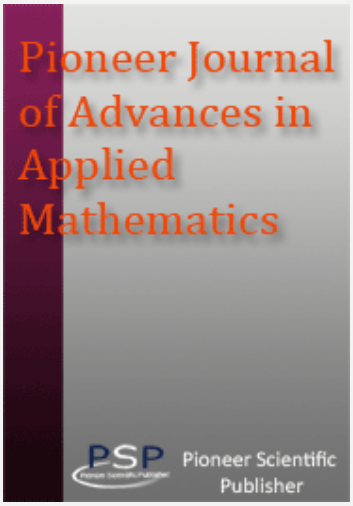

STEADY STATE PHOTOCURRENT STUDIES OF $PbSnS_3$ THIN FILMS DEPOSITED IN A VACUUM

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Abstract

In real semiconductors, especially polycrystalline thin films, the distribution of trapping centers are complex. These traps may have in addition to single discrete energy levels some other kind of energy distribution determined by various generation/recombination processes. The Scher-Montrol formula is developed to solve this problem, but it requires considerably complex mathematical analysis to obtain solution to photocurrent.

To evaluate trapping states, an attempted is made to reduce the Master Equation to set of Finite Differential Equation that is dependent on both light intensity and temperature. The equation was then solved for steady state photocurrent to assess these trapping levels in a vacuum deposited $PbSnS_3$ thin film. Preliminary results of the spectra of trapping states show that at moderate to high light intensity one net positive trapping and another net negative trapping event at different energy levels dominate the photoconductivity in the thin film.

Keywords and phrases: thin films, photoconductivity, multiple trapping levels, finite difference, LU decomposition.