

T_cSAM Bi-Weekly Brown Bag Seminar

Texas Center for Superconductivity and Advanced Materials



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“Prospects of Dilute Nitrides III-V Heterostructures for IR Photovoltaics and Recent Developments at T_cSAM”

Friday, August 6, 2004

Room 102, University of Houston Science Center
12:00 p.m. – 1:00 p.m.

Abstract

The unusual bandgap shrinkage that accompanies the incorporation of small amounts of nitrogen (< few percent) in III-V semiconductors has sparked both theoretical and experimental research in the arena of dilute nitrogen containing III-V alloys. While considerable progress has been made, the encountered low solubility of N in these alloys and their poor optical properties have thus far hindered the expected rapid proliferation of the technology for IR and optoelectronic applications.

The presentation highlights results of recent investigations at University of Houston on development of Ga(In)AsN based alloys and heterostructures (by RF- chemical beam epitaxy). Some key conditions favoring incorporation of large amounts of N (up to 7%) in epilayers are deciphered. In particular, the criticality of N-RF-plasma conditions (real time plasma spectroscopy) upon the incorporation of nitrogen in the solid and in controlling the optical properties of grown epilayers will be addressed.

Based on experimental data presented here, a new dilute nitride-superlattice material design (lattice matched to InP) is devised and its potential for mid-IR applications (0.4-0.6 eV) will be discussed.

Persons with disabilities who require special accommodations in attending this lecture should call (713) 743-8210 as soon as possible.

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