

Abstract Submitted  
for the SHOCK11 Meeting of  
The American Physical Society

**Free carrier lifetime reduction in shock-compressed GaAs<sup>1</sup>**  
PAULIUS GRIVICKAS, MATTHEW MCCLUSKEY, YOGENDRA GUPTA,  
Washington State University, INSTITUTE FOR SHOCK PHYSICS TEAM — Un-  
derstanding the changes in dynamic carrier properties, including lifetime, are im-  
portant for operation of gallium arsenide (GaAs) based optoelectronic devices. Sig-  
nificant carrier lifetime reductions were determined in GaAs:Te, shock-compressed  
along [100] to 4 GPa, using time- and spectrally-resolved photoluminescence (PL)  
measurements. Lifetime changes were extracted from PL signals extending over five  
orders of magnitude following a short excitation pulse in single event shock exper-  
iments. Several time-resolved recombination mechanisms showed a linear lifetime  
reduction in marked contrast to earlier hydrostatic pressure results. The present  
results suggest that the lifetime reaches a minimum at the direct-to-indirect band  
gap transition.

<sup>1</sup>Work supported by DOE/NNSA

Paulius Grivickas  
Washington State University

Date submitted: 14 Feb 2011

Electronic form version 1.4