Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Crosslink Density Variations with Process Conditions in Plasma Polymerized Photonic Films SOMESH PERI, MARK FOSTER, The University of Akron, JESSE ENLOW, HAO JIANG, TIMOTHY BUNNING, Wright Patterson Airf Force Base, BULENT AKGUN, SUSHIL SATIJA, CHARLES MAJKRZAK, National Institute of Standards and Technology — The structures of plasma polymerized homopolymer octafluorocyclobutane (PP-OFCB) films made under different processing conditions were studied using x-ray reflectivity (XR) and neutron reflectivity (NR). The processing parameters varied were monomer feed location, plasma power, and pressure. Each dry film had a surface layer of thickness $\sim$20Å and a thin layer of $\sim$10Å thickness at the substrate in which the crosslink density was lower than in the bulk polymer film. The region of lower cross-link density at the film-air interface reflects the extent of a reaction zone that moves with the deposition and is responsible for dictating the width of interfaces that are formed when a layer of different precursor is deposited atop the first layer. Results from bilayer films support this view. Such a reaction zone is also seen for benzene and iron-containing plasma polymerized films.

Somesh Peri
The University of Akron

Date submitted: 28 Nov 2008 Electronic form version 1.4