Abstract Submitted
for the SES08 Meeting of
The American Physical Society

Resonant Soft X-ray Reflectivity (RSoXR) for organic thin films characterrization CHENG WANG, BENJAMIN WATTS, TOHRU ARAKI, HARALD ADE, ALEXANDER HEXEMER, ANDRES GARCIA, THUC-QUYEN NGUYEN, GUILLERMO BAZAN, KAREN SOHN, EDWARD KRAMER, NCSU COLLABORATION, LBNL COLLABORATION, UCSB COLLABORATION —
The performance of organic multilayer PLED devices is strongly affected by the structure, e.g. chemical diffusion or physical roughness, of the interfaces between layers. Resonant soft x-ray reflectivity (RSoXR), a recently developed tool to characterize polymer thin films, is able to achieve greatly enhanced contrast between polymer components by tuning the photon energy to carbon 1s photon absorption resonances near 285eV. The measurement of interfacial width becomes possible without deuteration and the use of neutron reflectivity. The interfacial widths w of model bilayers of poly[9,9-bis(6'-N,N,N,-trimethylammoniumhexyl)fluorene-co-alt-1,4 phenylene bromide] (PFNBr)/poly[2-methoxy-5-(2'-ethylhexyloxy)-p-phenylene vinylene] (MEH-PPV) on SiO2 substrates manipulated by various sample preparation process were measured by RSoXR, allowing w to be correlated to device performance. In addition, for a real PLED device with a more complicated multilayer structure, but missing the top Al electrode, it was demonstrated that the top four interfaces can be fully characterized using RSoXR by adjusting the material contrast to selectively observe different layers at different photon energies.

Hongping Yan

Date submitted: 15 Aug 2008 Electronic form version 1.4