Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

White tandem OLED with carbon nanotube interlayer ALEXIOS PAPADIMITRATOS, Solarno Inc, Nanotech UT Dallas, RAQUEL OVALLE ROBLES, RAY BAUGHMAN, Nanotech UT Dallas, ANVAR ZAKHIDOV, Solarno Inc, Nanotech UT Dallas — White organic light emitting diodes (OLEDs) have become well recognized as an important candidate for future lighting and display applications. An existing idea to generate white color places R, G, B pixels in a side-by-side geometry. Also, white tandem OLEDs have been developed by vertically stacking in series multiple electroluminescent layers. However, such structures require a complex interfacial layer which is usually fabricated by strong dopants to form a p+/n+ interface. We have shown earlier that transparent carbon nanotubes (CNT) can be used as effective three dimensional charge injectors in polymer light emitting diodes[1] and OLEDs[2]. Now, we show that CNT can be used as an interlayer in two cell OLEDs with complimentary colors. We show that tandem devices with CNT interlayers, together with selective barriers and PEDOT:PSS coating can control the device color. In addition, the emission intensity can be controlled by independently tuning the driving voltage and current. In the case of overdoped p+/n+ interlayers we do not have this opportunity which is a great advantage of CNT injectors. We also compare the performance of multiwall CNTs vs. that of single wall CNTs in the tandem OLEDS. [1]R.H.Baughman et al.Science, 297,787-792(2002).[2]C.D.Williams et al.Appl. Phys. Lett. 93,183506(2008).

Alexios Papadimitratos

Date submitted: 23 Dec 2008 Electronic form version 1.4