Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Ferroelectric switching behavior in morphology controlled ferroelectric-semiconductor polymer blends for organic memory EUNHEE LIM, GREGORY SU, EDWARD KRAMER, MICHAEL CHABINYC, University of California, Santa Barbara — Memory is a fundamental component of all modern electronic systems. Organic ferroelectric memories are advantageous because they are thin and lightweight devices that can be made printable, foldable, and stretchable. Organic ferroelectric memories comprise a physical blend of an organic semiconducting polymer and an insulating ferroelectric polymer as the active layer in a thin film diode. Controlling the thin film morphology in these blends is important for electrical properties of the resulting device. We have found that when a semiconducting thiophene polymer with polar alkanoate side chains (P3EPT) is blended with well-studied ferroelectric polymer poly [(vinylidenefluoride-co-trifluoroethylene] P (VDF-TrFE), the resulting film has low surface roughness and more controllable domain sizes compared to the widely used poly (3-hexylthiophene). This difference allows more reliable study of the ferroelectric switching behavior in devices with domain size of about 100nm. The influence of the 3D composition measured by a combination of methods, including soft x-ray microscopy, on the electrical characteristics will be presented.

Eunhee Lim
University of California, Santa Barbara

Date submitted: 14 Nov 2014 Electronic form version 1.4