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Thermal Analysis of defects in Organic Light Emitting Diodes using Thermoreflectance imaging technique ACHYUT SHRESTHA, Hampshire College, ANDREW DAVIS, KENNETH CARTER, University of Massachusetts-Amherst, JANICE HUDGINGS, Mt. Holyoke College — Organic light emitting diodes (OLEDs) have emerged as a next generation technology for flat panel displays. One of the factors inhibiting commercialization of this technology are their shorter life spans. Various defects induced during fabrication and operation tend to grow with time causing catastrophic failure of the device. In our work, we use thermoreflectance imaging (TR) to study defects in OLEDs. TR is based on measuring the change in reflectivity of the device as a function of temperature. We want to study the defects before catastrophic failure. We're interested in the physical origin of the defects, under what conditions failure occurs, and how defects affect current injection uniformity. Several defects including dark spots and bright spots on the surface of OLEDs are visible through the TR imaging. In our experiment, we are making controlled defects in OLEDs to study specific thermal maps of various kinds of defects. Understanding local temperatures and heat spread via TR imaging will provide better insight into formation of defects, which could be used to increase the lifetime and efficiency of OLEDs.

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