

## Reconstructing Device Architecture of Organic Photodiode Using Etalon-Electrode for Color Filter Free Image Sensor Applications

윤성원, 하재연<sup>1</sup>, 심규민<sup>1</sup>, Syed Zahid Hassan<sup>1</sup>, 정대성<sup>1,†</sup>

대구경북과학기술원(DGIST); <sup>1</sup>대구경북과학기술원

(dchung@dgist.ac.kr<sup>†</sup>)

Here we realized the color-filter-free, wavelength-selective, thin-film (<800 nm) organic photodiodes (OPDs) and their image sensor arrays by introducing a novel electrode structure, “etalon-electrode”. Etalon-electrodes play dual roles of electrode and wavelength-selective filter. In other words, we have developed novel red-, green- and blue-selective organic image sensor pixels consisting of a new diode architecture that combines a dual functional etalon-electrode and a thin-film panchromatic photoactive layer to realize color filter-free, full color-detection with high detectivity. Furthermore, thanks to facile patterning of R/G/B pixels by utilizing new “etalon-electrode” strategy, we could demonstrate a color image capturing ability of organic image sensor without color filters. We believe that this strategy can be one of the solutions for realization of ITO- and color filter-free, thin film and color selective organic image sensors.