

Abstract Submitted  
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**Imaging Laser-Excited Blue LEDs** RUIMING CHEN, COLLIN EPSTEIN, TIM GFROERER, Davidson College, YONG ZHANG, University of North Carolina at Charlotte — Blue LEDs are known for their critical role in producing white light, since high-energy blue light is required to generate a spectrum of lower-energy light. In this experiment, we capture and analyze images of the optical emission from a blue LED under different temperatures and excitation conditions. Under non-uniform laser excitation, previous research has shown that light is emitted from areas without direct excitation. We call this phenomenon ELPE: Electro-Luminescence due to Photo-Excitation. Through further investigation, we find that LED droop (reduced device efficiency at high excitation) is only present in the ELPE from the non-excited area. At lower excitation levels, our theoretical model shows that heat loss is faster and more detrimental in the laser-excited region. These results provide important clues to the internal mechanisms that impede the performance of blue LEDs.

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