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**Efficiency in Piezoelectric GaInN/GaN Green Light Emitting Diodes.**

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The color of green is most closely related to human's perception of light, while red and blue have more of a signal character. Wide bandgap GaInN/GaN heterostructure devices successfully expanded the wavelength range of light emitting diodes (LEDs) from the red to blue and the UV. Performance in the green (500 – 570 nm), however, substantially lags behind requirements for energy efficient solid state white lighting. In particular, it is a significant challenge to extend the wavelength range from the blue back to the lower emission energies of green. Problems to incorporate high fractions of In and large biaxial strain are compounded by strong polarization properties of the material system. From detailed bandstructure spectroscopy we reveal that and how the piezoelectric properties play the pivotal role in the light emission properties. On these premises, polarization optimized green LED dies have been developed with superior performance at 525 nm and the deep green to 560 nm. In an ongoing process, device performance and efficiencies are analyzed and compared to a large set of sample data and provide relevant optimization feedback.