Hill, J., Gray, J., Zimi, H., Xie, E., McKendry, J., Cheng, C., Sagar, J., Herrnsdorf, J., Rajbhandari, S., Joshi, S. K., Oi, D., Haas, H., Henderson, R., & Dawson, M. (2026). *High-speed switching of UV-C LEDs for communications and sensing applications*. Abstract from 4th International Conference on UV-LED Technologies & Applications (ICULTA 2026), Berlin, Germany.

Abstract title: High-speed switching of UV-C LEDs for communications and sensing applications

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Abstract text (no longer than 250 words)

Recent years have seen a significant improvement in the availability of light-emitting diodes (LEDs) in the wavelength range 235-280 nm with output powers of a few mW or better. These UV-C LEDs are useful for a variety of applications, some of which require the LED light output to be switched on a nanosecond timescale. This presentation will focus on UV-C LED development towards two application areas, optical wireless communications (OWC) and stand-off hydrogen detection, which have overlapping requirements on the LEDs. OWC benefits from the low solar background at UV-C wavelengths and requires nanosecond switching to enable Gb/s data rates. Hydrogen is detected via Raman scattering, and UV-C operation is beneficial due to low solar background, low background from fluorescence, and increased Raman cross section. Additional range filtering using few-nanosecond time-of-flight information can improve the signal-to-noise ratio. UV-C LEDs have been shown to have modulation bandwidths of up to 0.8 GHz and are capable of delivering <5 ns optical pulses, thus serving both applications well. However, the optimal choice of LED depends on a complex balance of parameters, including device geometry, operating currents and voltages, wavelength, and specific requirements by the drive electronics. This presentation will explain key design considerations and their implications for OWC and sensing systems.

The abstract text is maximum 250 words long (~ no longer than half a page).

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Keywords (3 or more meaningful keywords):
UVC, Optical wireless communications, Stand-off gas detection, Time-of-flight ranging

Optional: References

J. Hill et al., "Effects of LED Device Size on UV-C Short-Range LoS Optical Wireless Communication," in IEEE Photonics Journal, vol. 15, no. 6, pp. 1-8, Dec. 2023, Art no. 7305108, doi: 10.1109/JPHOT.2023.3329980.

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Optional: Co-authors

Jonathan McKendry, Sujan Rajbhandari, Johannes Herrnsdorf (same affiliation as main author)

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