Docket #: S17-047

Low Power and Low Cost Coherent Optical Receiver

Stanford researchers have developed a low-power coherent optical receiver for high-speed data transmission between or within data centers. The receiver architecture uses electrical phase-locked loop (EPLL), and avoids high-speed analog-to-digital converters and digital signal processors. It has higher receiver sensitivity than commercially available receivers for short-reach communications and does not require local oscillator laser integration. This low-power and low-cost receiver is a great solution for cost-sensitive interconnects such as those used in data centers.

Stage of Research
Researchers have performed simulations comparing the proposed receiver with DSP-based receivers to demonstrate viability.

Applications

- **Optical receivers** for use within and between data centers, and metro level optical links.

Advantages

- **Low cost and low power**, when compared with coherent receivers based on power hungry digital signal processing (DSP).
- **Higher sensitivity** than current commercial receivers.

Publications

- J.K. Perin, A. Shastri and J. Kahn, "Design of Low-Power DSP-Free Coherent Receivers for Data Center Links," Journal of Lightwave Technology (2017), doi:10.1109/jlt.2017.2752079

Patents

- Published Application: 20200195354
- Issued: 11,218,224 (USA)

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