

Space Optical Coherent Receiver



Overview

We introduce an alternative receiver architecture for deep-space optical communication, in which a single large aperture is replaced by an array of smaller ones with outputs combined coherently, employing phase stabilization based on photon counting events. Optics Express, 32(25): 44799-44815. When citing this work, cite the original published paper. se. We report recent progress on technology developments at the NASA Glenn Research Center using photonic lanterns for coherent optical communications applications. In particular, the development of a spatial mode-diversity optical receiver using a photonic lantern combined with a photonic integrated. Abstract—We show the implementation of an optical coherent receiver suitable for inter-satellite communications supporting both Dual-Polarization Binary Phase Shift Keying (DP-BPSK) and Quadrature Phase Shift Keying (DP-QPSK) modulation formats, enabling data transmission at rates of up to 10 Gbps. In this paper, we propose and demonstrate a proof-of-concept FSO communication receiver based on a spatial demultiplexer and a photonic integrated circuit. Space-Polarization-Coded Coherent Receiver for LO Polarization-Insensitive Detection Hossein Najafi, Ali Bakhshali, Yule Xiong, Zhuhong Zhang, and Zhiping Jiang H.



Article Content

Ultra-Broadband Surface-Normal Coherent Optical Receiver with ...

A coherent receiver that can demodulate high-speed in-phase and quadrature signals of light is an essential component for optical communication, interconnects, imaging, and computing.

Robust free space optical communication receiver based on a spatial ...

In this paper, we present a free space optical (FSO) mode diversity receiver, based on a spatial demultiplexer and a silicon photonic coherent combiner to reduce the atmospheric turbulence

Coherent combiner for multimode free space optical communication ...

We present an experimental characterization of a thin film lithium niobate photonic integrated circuit (PIC) for a multimode free space optical communication receiver. The PIC coherently combines up to

Multi-aperture digital coherent combining for next-generation optical ...

Space terminals for free-space optical communication systems are under constant pressure to reduce their size, weight, and power profiles. Ground terminals with large collection areas are costly, but

Fiber-based free-space optical coherent receiver with vibration ...

We propose a novel fiber-based free-space optical (FSO) coherent receiver for inter-satellite communication. The receiver takes advantage of established fiber-optic components and

Chapter 10 Coherent Optical Communication Systems

10.1 Introduction The commercialization in 2008 of the first 40 Gb/s coherent optical communications systems employing polarization division multiplexing (PDM) Quadrature phase-shift keying (QPSK)

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A monolithic optical coherent receiver with quadrature detection is presented for the first time in an unmodified bulk CMOS chip. Networks of optical phase shifters and splitters distribute

Multi-Gbps Fiber-Optic Wavefront Sensing Coherent Optical Receiver

We are developing a low-cost, simplified, and highly scalable receiver concept for high-data rate coherent optical communications and atmospheric compensation. To this end we have designed a

Free space optical communication receiver based on a spatial ...

Abstract: Atmospheric turbulences can generate scintillation or beam wandering phenomena that impairs free space optical (FSO) communication. In this paper, we propose and demonstrate a proof

Implementation of a 10 Gbps Coherent Receiver for Free-Space

We show the implementation of an optical coherent receiver suitable for inter-satellite communications supporting both Dual-Polarization Binary Phase Shift Keying (DP-BPSK) and Quadrature Phase Shift

Multi-aperture digital coherent combining for free-space optical ...

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Free space optical communication receiver based on a

In this paper, we propose and demonstrate a proof-of-concept FSO communication receiver based on a spatial demultiplexer and a photonic

Free space optical communication receiver based on a spatial ...

The receiver collects the light from several Hermite Gauss spatial modes and coherently combine on chip the energy from the different modes into a single output. The FSO receiver is characterized with

Ultrahigh-speed graphene-based optical coherent receiver

This graphene-based optical coherent receiver will promise potential applications in 400-Gigabit Ethernet and 800-Gigabit Ethernet technology, paving another route for future high-speed

Sensitive optical free-space receiver architecture for coherent ...

We have investigated the multi-aperture and multi-mode receiver architectures together with optical coherent combining for reception of weak optical communications signals with focus on efficiency

OpEx Multi-Aperture Coherent v8

Abstract: Space-to-ground optical communication systems can benefit from reducing the size, weight, and power profiles of space terminals. One way of reducing the required power-aperture product on

Coherent Receiver

A coherent receiver is defined as a type of optical receiver that utilizes a local oscillator, typically a continuous wave laser, which oscillates at a frequency close to that of the incoming signal,

Space-Polarization-Coded Coherent Receiver for LO Polarization ...

We propose a space-polarization-coded (SPC) coherent receiver to achieve local oscillator polarization-insensitive (LO-PI) detection. Utilizing space dimension to construct a unitary channel based on

Spatial diversity detection using single-photodetector coherent ...

The spatial diversity detection is experimentally demonstrated for free-space optical (FSO) communications using a single-photodetector (single-PD) coherent receiver array with quadrature

Paper Title (use style: paper title)

In this work, we present the implementation of a DP-IQ coherent receiver suitable for free-space OISLs supporting dual-polarization binary phase shift keying (DP-BPSK) and quadrature and...

Sensitive optical free-space receiver architecture for coherent ...

Coherent detection is attractive as it offers both high spectral efficiency and sensitivity. Here, we numerically investigate two such large area receivers in the context of weak signal reception; the

Turbulence-Resilient Coherent Receiver Array on CMOS-Compatible

To address the unique challenges of free-space optical communication, particularly wavefront distortions induced by atmospheric turbulence, we present and experimentally

AOwave Series Analog Optical Modules

Analog optical transmitters and receivers are designed to meet the evolving needs of high-throughput radio frequency (RF) systems across various industries. AOwave analog optical modules support

High sensitivity receivers for free-space optical communication links

Thus it is crucial that these problems are solved if PSA pre-amplified coherent optical receivers are to enable high-speed, sensitive, communication for deep-space missions.

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