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‹ Back to results | 1 of 2 Next ›

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## Experimental all-optical relay-assisted FSO link with regeneration and forward scheme for ultra-short pulse transmission (Article)

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## Abstract

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This paper presents experimental results for an all-optical free-space optical (FSO) relay-assisted system by employing an all-optical regenerate and forward (AORF) scheme in order to increase the transmission link span. The ultra-short pulse (i.e., 2 ps) regeneration technique based on Mamyshev method is adopted. We have developed a dedicated experimental test-bed composed of optical fiber components and FSO links to demonstrate the proposed scheme and evaluate its performance in terms of the Q-factor and bit error rate (BER) under turbulence regimes for both single and dual-hop network architectures. We show that, using the AORF a hundred times improvement in the BER performance is achieved compared to the amplify-and-forward scheme for a fixed signal-to-noise ratio under turbulence conditions. 

## Indexed keywords

Engineering controlled terms: Bit error rate; Network architecture; Optical fibers; Optical signal processing; Q factor measurement; Signal to noise ratio; Turbulence

Engineering uncontrolled terms: All optical; Amplify and forward; BER performance; Experimental testbed; Free-space optical; Optical fiber components; Transmission link; Turbulence conditions

Engineering main heading: Ultrashort pulses

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