

## All-Optical Function Based on Self-Similar Spectral Broadening for 2R Regeneration in High-Bit-Rate Optical Transmission Systems

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**Abstract :** In this paper, we demonstrate basic all-optical functions for 2R regeneration (Re-amplification and Re-shaping) based on self-similar spectral broadening in low normal dispersion and highly nonlinear fiber (ND-HNLF) to regenerate the signal through optical filtering including the transfer function characteristics, and output extinction ratio. Our approach of all-optical 2R regeneration is based on those of Mamyshev. The numerical study reveals the self-similar spectral broadening very effective for 2R all-optical regeneration; the proposed design presents high stability compared to a conventional regenerator using SPM broadening with reduction of the intensity fluctuations and improvement of the extinction ratio.

**Keywords :** all-optical function, 2R optical regeneration, self-similar broadening, Mamyshev regenerator

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