Polarization-Sensitive NALM for Two-Level Amplitude Regeneration

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Abstract.

We propose and study analytically and numerically a nonlinear amplifying loop mirror scheme for multilevel amplitude regeneration, whose operation relies on the manipulation of light polarization. Polarization control increases the number of degrees of freedom of the setup, making it easier to meet the demanding requirements for regenerating complex modulation formats. By adjusting one of those additional parameters, namely, the ellipticity of input polarization, if all the other ones are properly set and fixed, the transfer characteristic is shaped for optimal two-level amplitude regeneration for two different state power ratios. The cascadability of the proposed scheme is demonstrated for the optical star-8 quadrature amplitude modulation format as an example.