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Abstract

We quantify the noise properties of supercontinuum (SC) generation in optical fibers using higher-order central moments. The higher-order moments quantify not only the mean and variance of a distribution, but also the asymmetry and the presence of long tails, and are thus particularly useful for identifying regions of long-tailed rogue wave like behaviour.

By carrying out multiple numerical simulations in the presence of noise, we demonstrate that the statistical moments of Coefficient of Variation, Skew and Kurtosis provide the necessary rigorous measure of the SC histograms to yield a clear means by which SC spectral fluctuations can be quantified under general conditions.