



Higher order moment description of supercontinuum noise and rogue wave statistics

Sørensen, Simon Toft; Bang, Ole; Dudley, John M.

Publication date:
2011

[Link back to DTU Orbit](#)

Citation (APA):

Sørensen, S. T., Bang, O., & Dudley, J. M. (2011). Higher order moment description of supercontinuum noise and rogue wave statistics. Abstract from Rogue Waves 2011: International Workshop, Dresden, Germany, .

DTU Library

Technical Information Center of Denmark

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Higher order moment description of supercontinuum noise and rogue wave statistics

Simon Toft Sørensen^{1,*}, Ole Bang¹, and John M. Dudley²

¹*DTU Fotonik, Department of Photonics Engineering, Technical University of Denmark, 2800 Kgs. Lyngby, Denmark*

²*Institut FEMTO-ST, UMR 6174, CNRS- Université de Franche-Comté, 25030 Besançon, France*

*Corresponding author: stso@fotonik.dtu.dk

Conference

Rogue Waves

International Workshop — 07 - 11 November 2011, Dresden, Germany

In association with the 70th birthday of Prof. Alan C. Newell

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.