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Effects of Cross-Correlation Between Real and Imaginary Parts ofColored Pump Noise in Transient Process of Single-Mode Laser

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Abstract: A two-dimensional single-mode laser model with cross-correlation between the real and imaginary parts of the colored quadric pump noise is investigated. A novel laser amplitude Langevin equation is obtained, in which the cross-correlation  $\lambda_p$  between the real and imaginary parts of the pump noise appears. The mean, variance, and skewness of first-passage-time are calculated. It is shown that the mean, variance, and skewness of first-passage-time are strongly affected by  $\lambda_n$ .

PACS: 05.40.-a, 02.50.-r, 02.60.-x Key words: single-mode laser, colored quadratic pumps noise, cross-correlation between the real and imaginary parts of pump noise

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