

论文

周期信号调制色泵噪声驱动下单模激光光强关联函数的时间演化特性

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摘要:

采用周期信号调制色泵噪声驱动的单模激光模型,运用线性化近似方法研究了单模激光系统光强关联函数 $C(t)$ 随时间的演化关系,分析了调制信号的振幅 $B$ 、频率 $\Omega$ 等对光强关联函数随时间演化的影响.发现在泵噪声自关联时间 $\tau > > 1$ 的情形下,随着调制信号频率 $\Omega$ 、振幅 $B$ 的增加, $C(t)$ 随时间的演化为单调衰减;在 $\tau > > 1$ 的情形下,随着调制信号频率 $\Omega$ 、振幅 $B$ 的增加, $C(t)$ 随时间的演化均为周期性振荡衰减.

关键词: 单模激光 光强关联函数 噪声 自关联时间

Time Evolution Properties of Intensity Correlation Function of Single Mode Laser Driven by Periodic Signal Modulating Coloured-pump Noises

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Abstract:

Using the linear approximation method, the intensity correlation function  $C(t)$  of a single mode laser system was calculated and the time evolution of  $C(t)$  was researched as well as the influence of modulation signal frequency  $\Omega$  and amplitude  $B$  on  $C(t)$  was analysed in detail. In the case of the pump noise self-correlation time  $\tau < < 1$ , it was found that when modulation signal frequency  $\Omega$  and amplitude  $B$  increase, the time evolution of  $C(t)$  experiences monotonous descending; however, in the case of  $\tau > > 1$ , as modulation signal frequency  $\Omega$  and amplitude  $B$  increasing, the time evolution of  $C(t)$  exhibits periodically surging with descending envelope.

Keywords: Single mode laser Intensity correlation function Noise Self-correlation time

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