



Optical coherence of a scalar wave influenced by first-order and second-order statistics of its random phase

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Auteur	Chapeau-Blondeau, François [1], Gindre, Denis [2], Barille, Régis [3], Rousseau, David [4]
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Mots-clés	interferometry [5], Optical [6], phase [7], Statistical [8], stochastic [9]
Résumé en anglais	<p>We analyze a simple model of a scalar optical wave with partial coherence. The model is devised to describe the influence on the coherence of the wave, of the statistical properties of its random phase, including both the second-order statistics (phase correlation) — which is classic, but also the first-order statistics (phase distribution) — which is nonclassic. Expectedly, upon increasing the disorder of the fluctuating phase through a reduction of its correlation duration, the model shows that the coherence of the wave is always reduced. By contrast, upon increasing the disorder of the fluctuating phase through an increase of its dispersion, the model reveals that the coherence of the wave can sometimes be enhanced. This beneficial consequence of an increase in disorder is related to the phenomenon of stochastic resonance or improvement by noise in signal processing.</p>
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Liens

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