Title:	Entanglement and Complete Positivity: Relevance and Manifestations in Classical Scalar Wave Optics
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Abstract:	Entanglement of states and Complete Positivity of maps are concepts that have achieved physical importance with the recent growth of quantum information science. They are however mathematically relevant whenever tensor products of complex linear (Hilbert) spaces are involved. We present such situations in classical scalar paraxial wave optics where these concepts play a role: propagation characteristics of coherent and partially coherent Gaussian beams; and the definition and separability of the family of Twisted Gaussian Schell Model (TGSM) beams. In the former, the evolution of the width of a projected one-dimensional beam is shown to be a signature of entanglement in a two-dimensional amplitude. In the latter, the partial transpose operation is seen to explain key properties of TGSM beams.
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