

Abstract Submitted  
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**Generation of entangled macroscopic light fields with a coupled gain-loss waveguide** SAEID VASHAHRI-GHAMSARI, BING HE, MIN XIAO, University of Arkansas — We explore a Parity-Time (PT)-symmetric optical system of two coupled single-mode waveguides. One of the waveguides contains a gain medium, while the second one is with a loss medium. The magnitude of the gain can be adjusted to be equal to that of the loss, so that the PT-symmetric condition will be achieved. Moreover, we add a squeezing element to one of the waveguides. The squeezing can be generated in a parametric down conversion process. Moreover, we have included both amplifying and decaying noises in the process. It is shown that the squeezing intensifies the noise-induced photon emission and leads to the entanglement of the output light fields. Under certain conditions, the noises tend to eliminate the entanglement. If the input beam is strong, the entanglement due to the squeezing can become strong enough to overcome the noise effects, resulting in macroscopic entangled output fields.

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