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Continuous-Variable entanglement generation in a three-wave mixing process SAEID VASHAHRI GHAMSARI, BING HE, MIN XIAO, Univ of Arkansas-Fayetteville — We have considered the three-wave mixing process as a scheme for generating continuous-variable entanglement. In the undepleted pump approximation, the propagation of signal and idler waves in a waveguide is shown to be equivalent to two mixed modes propagating in two linear channels with equal loss and gain. Moreover, the phase mismatch between signal and idler waves plays the role of coupling between the two modes. Therefore, this system respects the PT-symmetry condition. On the other hand, a PT-symmetric system is a good candidate for generating "amplified" continuous-variable entanglement (macroscopic entanglement). If the signal and idler waves are prepared in the squeezed coherent state, the output fields are entangled. The virtue of this scheme is that, in contrast to traditional PT-symmetric systems, here the gain, loss, and coupling are parametric variables and hence one can control them by adjusting the amplitude and phase of the pump wave. In addition, the quantum noise effect in this parametric process is negligible.

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