

Abstract Submitted  
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**A Spontaneous Parametric Downconversion Source for Tests of Single Photon Quantum Mechanics** R. SETH SMITH, Francis Marion University — During the spontaneous parametric downconversion process, a single photon of one frequency is converted into two photons of lower frequency in a nonlinear crystal. The input wave is referred to as the “pump” and the output waves are referred to as the “signal” and “idler”. The process is said to be “spontaneous” because there are no input signal or idler fields. Rather, these fields are generated spontaneously inside the nonlinear crystal. The process is “parametric” because it depends on the electric fields, rather than just their intensities. This creates a definite phase relationship between the input and output fields. It is called “downconversion” because the signal and idler fields are at a lower frequency than the pump field. The setup, operation, and performance of a spontaneous parametric downconversion source will be described, as well as future applications of this source for tests of single photon quantum mechanics.

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