

Abstract Submitted
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Development and Characterization of a Periodically Poled Lithium Niobate Photon Pair Source SEAN KRUPA, ERIC STINAFF, Ohio Univ, LEE OESTERLING, DAVID NIPPA, Battelle Memorial Institute — A photon pair source made of Periodically Poled Lithium Niobate (PPLN) was developed for degenerate and non-degenerate type-0 Spontaneous Parametric Downconversion (SPDC) of 775-780nm light to telecom wavelengths. Research consisting of characterization and an iterative design/development process resulted in a PPLN photon pair source suitable for commercial application. Focusing on losses and heralding efficiency, different waveguide geometries and manufacturing techniques were tested, characterized, and optimized. The best PPLN devices created feature insertion losses of 3dB and heralding efficiencies of 70% making them exceptional for use in emerging quantum applications. Further integration of fiber optic components will be done to expand the capabilities of the devices. Other current research is focused on further characterization of the devices, specifically the SPDC spectra and a direct measurement of the effective nonlinear coefficient in the PPLN waveguides. These measurements will be discussed in detail as well as an overview of the project. This work seeks to improve the performance of PPLN waveguides for use in quantum technologies.

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