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An integrated single photon source is a key to chip-scale quantum information processing. Periodically poled lithium niobate (LN) waveguides have shown promise for the quantum source due to their large spectral tunability and high efficiency benefiting from quasi-phase-matching (QPM). The traditional fabrication method for QPM is the electric field poling, but the process is complex because the mask and lithography are needed to design the poling structure. Recently, in collaboration with Professor Yan Sheng from Australian National University, the research group from the School of Physics at Nankai University, led by Professor Yongnan Li, has demonstrated photon-pair sources based on LN waveguides periodically poled by tightly focused femtosecond laser, which verifies the feasibility of periodical poling by femtosecond laser in the application of integrated quantum light sources. This method can be extended to three-dimensional domain structures, which provide a potential platform for steering the spatial degree of freedom of entangled two-photon states.

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The color images are shown online.