
Nanoscale domain engineering in lithium niobate

Nanjing University, China

Yong Zhang

Email: zhangyong@nju.edu.cn

Lithium niobate is a powerful platform for integrated photonic applications including wavelength converters, electro-optic modulators, and optical frequency combs. Recently, advanced applications in nonlinear and quantum optics require to controllably fabricate nanoscale domain structures in lithium niobate. Here, we report on the fabrication of stable nanodomain structures through femtosecond laser writing and piezoelectric force microscopy tip poling in lithium niobate bulk crystal and thin film. The feature size reaches sub-100 nm, the period of domain structure is reduced down to 100 nm and the duty cycle is kept ~50%. We also demonstrate its application in nonlinear and quantum optics. Our method paves a way to precisely manipulate frequency conversion and quantum entanglement in lithium niobate.



Short Bio:

Yong Zhang received his PhD degree in Condensed Matter Physics from Nanjing University, China. He is a Professor at College of Engineering and Applied Sciences and National Laboratory of Solid State Microstructures, Nanjing University. He has been dedicated to the researches on lithium niobate nonlinear photonic crystal and its nonlinear and quantum optics. He has published more than 100 journal papers including Nature, Nature Photon., Phys. Rev. Lett., Light Sci. Appl., Nature Commun., Adv. Photon., Adv. Mater., Nano Lett., Optica, etc.