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## Second harmonic generation in reversed-polarized double-layer thin film lithium niobate devices

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Second harmonic generation (SHG) extends coherent light sources to shortwave bands. Thin-film lithium niobate (TFLN) waveguides and resonators are good platforms for realizing efficient second-order nonlinear optical effects because of their significant second-order nonlinear optical coefficients and the ability to enhance light intensity. In this talk, I will report on our group's recent progress in highly efficient SHG in reverse-polarized double-layer TFLN waveguides and micro-resonators. Under 1550 nm continuous laser pumping, the absolute SHG conversion efficiency of the reverse-polarized double-layer TFLN waveguide is 45%. In addition, an absolute (normalized) SHG conversion efficiency of 30% (440000% /W) has been achieved on a reverse-polarized double-layer X-cut TFLN micro-ring with a sub-microwatt continuous pump. Compared with periodically-poled TFLN waveguides and micro-resonators, the reverse-polarized double-layer TFLN devices with excellent nonlinear optical properties are more accessible to manufacture and more likely to be widely used because the process of periodic polarization is eliminated.

### **Short Bio:**



**Fang Bo** is a professor at Nankai University. He received his B.S. (also B.E.) and Ph.D. degrees from Nankai University in 2002 and 2007, respectively. From 2013 to 2014, Dr. Bo was a visiting scholar at Washington University in St. Louis. Dr. Bo's research interests include micro-/nano-optics, quantum optics, and nonlinear optics, especially the fabrication and nonlinear effects of on-chip lithium niobate resonators. He is the author of one chapter of a book and more than 100 journal publications, which were cited for more than 2500 times. He has made more than 40 invited

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presentations at critical academic conferences. He serves as Editor of COL, CPL, and other magazines.