



# Advances in OptoElectronics

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## Research Article

### Formation of MgO:LiNbO3 Domain-Inverted Gratings by Voltage Application under UV Light Irradiation at Room Temperature

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#### Abstract

MgO:LiNbO3 is an attractive nonlinear-optic crystal for quasiphasematched (QPM) nonlinear-optic devices. This paper reports a new formation method of domain-inverted gratings for QPM in MgO:LiNbO3. Domain inversion of MgO:LiNbO3 by voltage application under UV light was characterized, and reduction of the voltage required for inversion was demonstrated. Results of voltage application under periodic UV light suggested that suppression of excess lateral expansion of the domain inverted regions on -Z surface was crucial for domain-inverted grating formation. Voltage application to a crystal with a photoconductive cladding layer under periodic UV light was proposed. The cladding layer suppressed the expansion, and the domain-inverted gratings with period of 18 μm and area of 25×5 mm<sup>2</sup> were obtained. The formation method does not require the photolithography process and allows the formation by voltage application at room temperature, and therefore, is quite simple and productive.