

04,13

Effective charge in LiNbO₃ films fabricated by radio-frequency magnetron sputtering method

© M. Sumets¹, E. Belonogov², V. Dybov², D. Serikov², A. Kostyuchenko², V. Ievlev^{1,3}, G. Kotov⁴

¹ Voronezh State University,
Voronezh, Russia

² Lomonosov Moscow State University,
Moscow, Russia

³ Voronezh State Technical University,
Voronezh, Russia

⁴ Voronezh State University of Engineering Technologies,
Voronezh, Russia

E-mail: maxsumets@gmail.com

Received: July 16, 2019

Revised: July 16, 2019

Accepted: July 25, 2019

Amorphous Li–Nb–O films were deposited onto Si substrates by radio-frequency magnetron sputtering method. The fabricated heterostructures demonstrated the presence of effective oxide charge Q_{eff} having both negative and positive components. Thermal annealing (TA) of as-grown heterostructures leads to the crystallization of a Li–Nb–O system with the formation of LiNbO₃ films. The Q_{eff} changes with TA, reaching a minimum at the annealing temperature of about 470°C, corresponding to the entire film's crystallization.

Keywords: lithium niobate; LiNbO₃, sputtering, thin films, crystallization, oxide charge.