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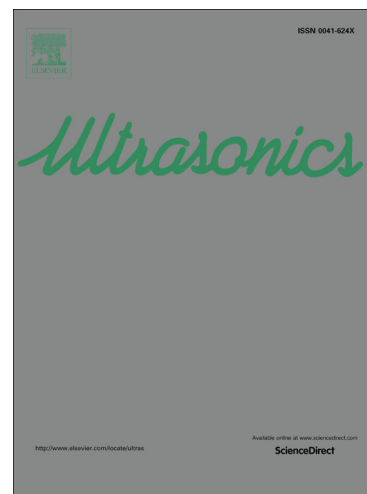
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## Composite Lateral Electric Field Excited Piezoelectric Resonator

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**Abstract.** The novel method of suppression of parasitic oscillations in lateral electric field excited piezoelectric resonator is suggested. Traditionally such resonator represents the piezoelectric plate with two electrodes on one side of the plate. The crystallographic orientation of the plate is selected so that the tangential components of electric field excite bulk acoustic wave with given polarization travelling along the normal to the plate sides. However at that the normal components of field excite the parasitic Lamb waves and bulk waves of other polarization which deteriorate the resonant properties of the resonator. In this work we suggest to separate the source of the HF electric field and resounded piezoelectric plate by air gap. In this case the tangential components of the field in piezoelectric plate do not practically weaken but normal components significantly decrease. This method is realized on the composite resonator having the structure “glass plate with rectangular electrodes – air gap – plate of 128 Y X lithium niobate.” It has been shown that there exist the optimal value of the width gap which ensure the good quality of series and parallel resonances in frequency range 3-4 MHz with record values of Q – factor of ~15000 in both cases.

## 1. Introduction

In last years the great attention of researchers is attracted by lateral electric field excited piezoelectric resonators [1-12]. This interest is connected with the fact that acoustic liquid sensors based of aforementioned resonators have some advantages in comparison with

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