SINGLE SH-SAW SENSOR AS A DISTRIBUTED SENSOR ARRAY FOR LIQUIDS RECOGNITION

R.G. Kryshtal, A.V. Medved

Fryazino Branch of the Kotel'nikov Institute of Radio Engineering and Electronics

of Russian Academy of Sciences

Vvedensky sq., 1, Fryazino, Moscov region, 141190 RUSSIA

Emails: avm@ms.ire.rssi.ru

Abstract- Basic possibility to use single-channel shear-horizontal surface acoustic waves sensor constructed as a delay line on multilayered structure with 36^{O} YX $LiTaO_3$ substrate for liquids recognition has been proposed. The changes under analytes influence of the sensor pulse responses obtained by transformation to time domain of one of the S-parameters measured in frequency domain have been used as sensor responses. Examples of responses to some liquid analytes have been demonstrated for a sensor based on $LiTaO_3$ – SiO_2 – molecularly imprinted polymer layered structure. Qualitative explanation of the result is given by treating such a sensor as a distributed sensor array.

Index terms: Liquid analyte, SH-SAW delay line, 36^{O} YX $LiTaO_3$ substrate, wave reflections, sensor array, S-parameter, fast Fourier transform, molecularly imprinted polymer.