

DEPARTMENT OF ELECTRICAL ENGINEERING

Graduate Seminar Guest Speaker

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WAVE PHENOMENA IN PERIODICALLY CORRUGATED WAVEGUIDE

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Abstract

In the report, wave phenomena in a periodically corrugated waveguide are analysed in detail. The corrugation causes Bragg reflection and opening of the gap (stop band) in the spectrum of the waveguide. It is shown that the width of the Bragg gap depends on the relative position of two periodic boundaries. It varies from zero to a maximum value upon shifting of one periodic boundary with respect to another on the half period of the corrugation. The effect allows to control a value of the gap and transmission through the waveguide at a desirable frequency in this simple way. In a case of the congruent boundaries, the Bragg gap does not open, and the wave propagates in the periodic waveguide without Bragg reflection.

Biography

Victor Pogrebnyak received his Ph.D. (1974) and the D.Sc. (1990) degrees in semiconductor physics from Institute for Radio Physics and Electronics (IRE), National Academy of Science, in Kharkiv, Ukraine. Till 1999, he was a Senior Research Scientist at IRE. Since 1999, he has been a Professor with the Electrical and Electronics Engineering Department at Cukurova University in Adana, Turkey. During this summer, he is a Visiting Scholar in the EE Department at University at Buffalo. He conducts experiments (together with Prof. James Whalen) in microwave laboratory on wave propagation in a periodic waveguide.

Dr. Pogrebnyak's current areas of research are photonic crystals and periodic media, meta-materials, electron transport in the lateral nanostructures, and microwave detectors.