# Abstracts

## Microwave Faraday Effect and Propagation in a Circular Solid-State Plasma Waveguide

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The microwave Faraday effect in a solid-state plasma waveguide under a relatively high magnetic field (μ/sub e/B/sub 0/>>1) is investigated. Field configurations in the solid-state plasma waveguide are first analyzed. It is shown that two types of nondegenerate circularly polarized quasi-TE waves exist in the waveguide. The propagation constants of the quasi-TE waves are obtained by means of a variational method. The microwave Faraday effect in the solid-state plasma waveguide is formulated. It is shown that geometrical factors and reflections from the waveguide discontinuities have significant influences on the Faraday effect. Experimental results of the Faraday effect at 36 GHz through a solid-state plasma waveguide are reported. In the experiment n-type indium antimonide crystals are used. The comparison of the experimental data with the theory shows good agreement.

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