

The thesis is devoted to a research on metamaterials for terahertz spectral range based on deeply etched silicon. The aim of the work is a theoretical conception and experimental realization of wave plates for selected terahertz frequencies. These wave plates are made of silicon substrates with an etched two-dimensional periodic microstructure where the dimensions of an elementary cell are below the considered wavelength. Theoretical proposal is optimized using the transfer matrix formalism. We designed and experimentally characterized quarter-wave plates for frequencies 0.5 THz and 1 THz and a half-wave plate for frequency 1 THz.