detection efficiency at the wavelength of laser radiation 1550 nm. The detection efficiency was evaluated based on the maximum signal amplitude. It was obtained that for pure GaSe r_{eff} = 0.975 pm/V, for the most efficient crystal $Ga_{50\%}Se_{44\%}S_{6\%}$ r_{eff} = 1.262 pm/V. These results are in good correlation with other studies at another wavelengths.

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TERAHERTZ WAVE DETECTING IN GASE:S CRYSTALS AT A TELECOM WAVELENGTH

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$Ga_{50\%}Se_{(50-x)\%}S_{x\%}$ crystals, where x has values 0, 1.5, 6, 8 and 11, were investigated as terahertz pulse detectors of at a laser wavelength of 1.55 μm. The optical and terahertz properties of the crystals, such as refractive indices, coherence lengths and electro-optical coefficients are measured. At the wavelength of laser radiation 1550 nm, it was demonstrated that the $Ga_{50\%}Se_{44\%}S_{6\%}$ sample has the maximum detection efficiency. The detection efficiency was evaluated based on the maximum signal amplitude. It was shown that for pure GaSe electrooptic coefficient r_{eff} had a value of *0.975 pm/V,* for the most efficient crystal $Ga_{50\%}Se_{44\%}S_{6\%}$ r_{eff} = *1.262 pm/V.* These results are in good correlation with other studies at another wavelengths.

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2-OCTAVE ACHROMATIC QUARTER-WAVE PLATE FOR TERAHERTZ APPLICATIONS

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Terahertz time-domain technology has attracted more and more attention of scientists in the recent years. Polarization, as one of the Important properties of electro-magnetic wave, is studied and applied in the terahertz frequency range. Polarimetry is often used to characterize and examine materials. However, THz achromatic waveplate, as is a key component of THz time-domain polarimetry, hasn't been thoroughly studied yet. Waveplates are usually made by optical materials with birefringence, such as quartz and MgF_2. There is a proposal using a stake of monochromatic waveplates with optical contact bonding [1,2]. Nevertheless, the given proposal only works for certain frequency range and can't be applied on other frequency range. Several unconventional approaches towards THz achromatic waveplates have been demonstrated, such as silicon grating [3], stacked parallel metal plates [4], metamaterial [5,6] and prism using internal total reflection [7]. However, these solutions are either complicated to be fabricated, or not eligible for wide usage due to losses caused by high absorption for Fabre-Pero interference. In this paper we provide an alternative design of a compact THz achromatic quarter-wave plate working in the frequency range of 2 octaves in THz frequency range. The proposed waveplate consists of 3 quartz plates and is manufactured using optical contact bonding. The thicknesses and the rotation angles of optical axis of each quartz plate are the key parameters of the waveplate. The working frequency range of the waveplate is changeable by modifying the thicknesses and the rotation angles, which can be calculated using a simplified formula. The theoretical and experimental results of retardation and ellipticity angle for 2-octave THz achromatic quarter wave-plate were provided and analyzed.

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