

UKRAINIAN AND LITHUANIAN heraldic symbols through terahertz emission spectroscopy

B. Škėlaitė¹, V. Jakėstas¹, M. Treideris¹, A. Biėiūnas¹, K. Ikamas^{1,2,3}, R. Butkutė¹ and I. Grigelionis^{1,*}

¹*Center for Physical Sciences and Technology, Saulėtekio 3, 10257 Vilnius, Lithuania*

²*Institute of Applied Electrodynamics and Telecommunications, Vilnius University, Saulėtekio 3, 10257 Vilnius, Lithuania*

³*General Jonas Žemaitis Military Academy of Lithuania, Šilo 5A, 10322 Vilnius, Lithuania*

Email: ignas.grigelionis@ftmc.lt

Metasurfaces used in optics promise a plethora of ways of light manipulation [1, 2]. Recently, we have proposed a thermal terahertz source with narrow spectral features featuring the square metacells and based on GaAs technology, widely used in terahertz (THz) photonics [3]. Indeed, the metacells, can be of various complex shapes, allowing for an unlimited number of combinations to pick from according to one's needs.

Here we report on the thermal terahertz emission from the n-GaAs/GaAs structure equipped with the Ti/Au metasurface where the metacell shape was chosen to be of heraldic origin, that is either the Ukrainian Trident or the Lithuanian Columns of Gediminids. The experiments were performed using far-infrared Fourier spectroscopy, where the heated sample served as the source of THz radiation. The optical properties of such structures were simulated numerically in order to explain the origin of experimentally observed spectral features. The deconstruction of the simulated spectra was also performed by simulating the properties of simplified shapes which constitute the metacells of the heraldic symbols investigated here. The spectral analysis suggests the similarity between the investigated symbols, which is also reviewed from the historical point of view.

REFERENCES

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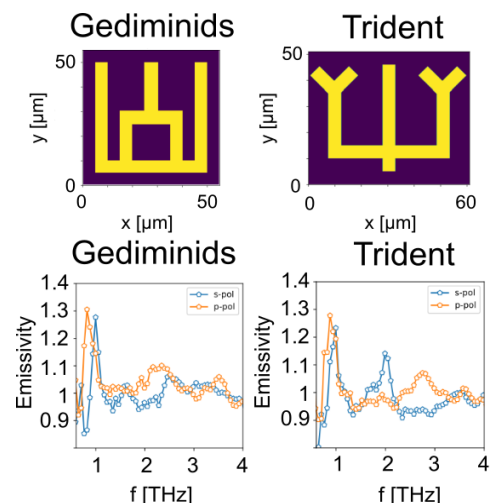


Fig. 1 Metacells of Ukrainian and Lithuanian heraldic symbols and corresponding terahertz thermal emission spectra