

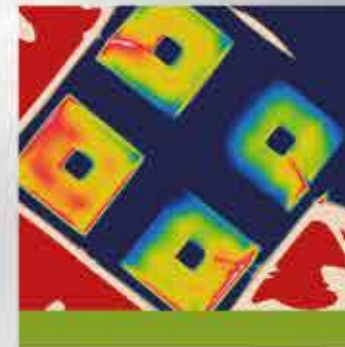
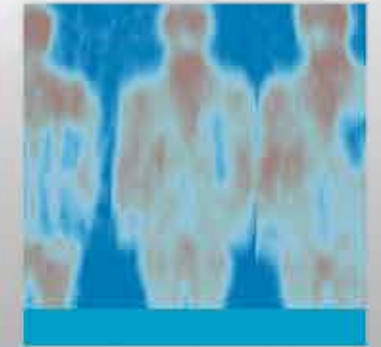
Infrared and Thermovision Technology Division

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The research carried out by the Infrared and Thermovision Technology Division covers non-contact temperature measurements, thermovision measurements, and infrared technology used in devices developed for the Polish Armed Forces. The funding for scientific research is provided mainly by the Ministry of Science and Higher Education in the form of statutory tasks, individual research grants, fellowships for doctoral students, development projects, and targeted projects. In recent years, the statutory tasks were dedicated to thermographic and spectroradiometric measurements of objects and the development of integrated optoelectronic sensor systems for military applications. The current research of the division focuses on the development of thermovision cameras with cooled and uncooled array detectors.

RESEARCH

- Military applications of infrared technology:
- Thermo-detection systems for intelligent ammunition
 - Multisensor detection systems
 - Infrared sensors for protection systems
 - Detection systems for infrared objects
 - Thermovision cameras with cooled and uncooled detectors
 - Thermovision cameras for individual soldier equipment systems
- Thermovision and infrared pyrometry of infrared radiation:
- Thermovision measurements and thermal image analysis

- Development and fabrication of infrared pyrometers
- Development and fabrication of infrared radiation sources
- Calibration and standardization of infrared pyrometers
- Characterization of thermovision cameras, visible light cameras, and laser rangefinders

Testing of thermo-detection components and assemblies:

- Measurement of spectral characteristics of infrared detectors
- Measurement of spectral characteristics of optical components
- Measurement of angular characteristics of infrared sensors
- Climatic measurements of infrared detection systems

Modelling and theoretical analyses:

- Modelling of infrared radiation detection processes
- Simulated operation of thermo-detection systems and devices
- Determination of multispectral signatures of infrared objects
- Determination of the operating range of thermo-detection devices

PROJECTS

Targeted projects:

- Rangefinder-observation binoculars with an eye-safe laser rangefinder, thermovision camera, GPS receiver, and electronic compass
- Thermovision cameras with detector arrays for sights and fire control systems

Development projects:

- Thermovision camera in the spectral range of 8-12 μm with a 640x480 detector array for observation devices
- Thermovision camera with a photon array detector for the observation systems of modern armament

Individual research grant:

- Development of fabrication technology for a multisector, highly stable infrared radiator for a test stand to measure the thermal resolution of military thermovision cameras
- Development of an algorithm for image quality enhancement of thermovision sights and infrared battlefield observation equipment

ACHIEVEMENTS

The recently completed targeted projects in collaboration with Przemysłowe Centrum Optyki S.A. resulted in the development of:

- CTS-1 thermovision sight
- KT-1 camera with cooled detector for fire control systems
- LOP-1 rangefinder-observation binoculars

RESEARCH FACILITIES

The Research Facilities of the division are being constantly upgraded and expanded by purchasing new equipment as well as manufacturing original equipment and building various test stands, which are also used for educational purposes. The laboratory base for educational tasks consists of highly specialized equipment for characterizing the elements, components, and devices for infrared technology. The unique measuring equipment located in the Research Facilities of the division includes:

- Set of highly sensitive thermovision cameras for near, middle, and far infrared
- Set of Fourier transform infrared imaging spectroradiometers for middle and near infrared
- Test stand for evaluating thermovision cameras, visible light cameras, and laser rangefinders

Selected scientific research and teaching laboratories:

- Test stand for determining the spectral characteristics of optical materials, infrared sources, and infrared detectors
- Test stand for evaluating thermal cameras, visible light cameras, night vision devices, and laser rangefinders
- Test stand for microscopic thermal imaging

Thermovision system



CTS-1 thermovision sight



LOP-1 day/night rangefinder-observation binocular