

## **The infrared radiometers family**

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The infrared radiometers family is designed for distant Earth sounding for the sake of solving the wide sphere of civil applications problems. The family is represented by two types of radiometers: with electronic and electronic – mechanical scanning of observation objects, and is counted on the shooting in the atmosphere transparency windows in the spectral range from 2 to 12  $\mu\text{m}$ . The family is based on the use of unified optical system, which is proposed by authors of this report and is registered in the Russian Federation State Inventions Register (Patent № 2220430 by 27.12.2003).

The optical system consists of concave main mirror, aperture stop and lens compensator, which are placed in converging ray beams, and focal plane array (FPA). The zone of rays propagation between diaphragm and FPA is bounded by background stop tube. Aperture stop and background stop tube have being cooled to cutoff the thermal background from the unit construction non-optical elements. The scheme provides high temperature resolution at retaining the simplicity and small dimensions. The radiometers family is based on the use of typical key elements: (1) main mirror; (2) central unit, including aperture stop, lens compensator and cryogenic background stop screen (tube); (3) the system of maintenance the temperature regime of aperture stop and cryogenic background stop screen; (4) receiving unit with FPA and preliminary information processing system; (5) FPA calibrator; (6) video information processing unit; (7) the through channel calibration system. The receiving unit FPA works in all working range. For radiometer with enlarged field of view 18 - 20°; the key elements list is completed by flat scanning mirror on the system entrance. In the report the composition schemes of two above presented radiometers types will be presented.