



Fig. 2. Polychromatic diffraction MTFs of the developed 320-mm F4 catadioptric lens: field numbers #1 to #5 correspond to field angles 0° , 0.5° , 1.0° , 1.5° , and 1.85° , respectively

The report presents the details and results of research that may be interesting for optical designers.

Keywords: catadioptric lens, nanosatellite, CubeSat, mirror, second-order aspheric, MTF.

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DETERMINATION OF TARGET ACQUISITION AND RECOGNITION TIME WITH ENGAGEMENT OF LAND UNMANNED COMPLEX

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Introduction. Land unmanned complexes (LUC), also known as unmanned ground vehicle, are widely used in manufacturing, mining, agriculture. Also they are used in different emergency situations, such as fire fighting, urban, cave, combat search and rescue et.

Analysis of the LUC development trends in leading countries shows engagement of the robots for execution of the reconnaissance, engineering, and logistical tasks [1]. They deal with prospects of heavyweight and middleweight classes LUC [2]. Therein an assessment of LUC participation results in task management is important. A model, taking into account different impact factors, is applied for that assessment. Usually such models lie in military domain [3]. But there are a lot of same elements in models irrespective of the field of their application. Object acquisition and recognition time or probability are very important features of any type of LUC.

Problem Statement. Existing LUC models are mostly aimed on combat engagement. They do not permit to assess the time behavior of non-battle specific situation and it should be upgraded.

Purpose. The purpose of report is to upgrade an existing method for determination of object acquisition and recognition time with engagement of LUC.

Materials and Methods. LUC equipped with both wide-angle TV-camera and TV-sight is considered as the basic vehicle for wide areas of use. LUC operator is also taken into account.

Results. The main parameters of viewing process at acquisition and recognition: condition of image watch and target contrast are took into consideration. Time of target acquisition and recognition is assessed for different contrast and target image watch conditions: on board display and head-mounted indicator.

Conclusion. Assessment results have shown following. Time of target acquisition with application of head-mounted indicator is greater sufficiently then one with application of board display. Therefore, information should be presented on board display at target acquisition by wide-angle TV-camera. Time of target recognition with application of head-mounted indicator is greater sufficiently then one with application of board display. Therefore, information should be presented on board display too at target recognition by TV-sight.

Keywords: land unmanned complex, object acquisition, object recognition.

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AUTOMATED DESIGN OF SHORT-WAVE INFRARED TELEPHOTO LENS

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Short-wave infrared (SWIR) light has unique characteristics, since it can provide the strong contrast and high resolution of nighttime imaging.

The lenses for the SWIR wavelength range still transmit light through optical glasses, and thus they can be manufactured by the same techniques as classic visual lenses. However, to achieve high image quality, SWIR-lenses must be carefully corrected for chromatic aberrations.