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We report the discovery of a new variable star during the search for new exoplanets in the Centaurus constellation from the FRAM telescope archive, operated by the FRAM team at Los Leones, near Malargüe, Argentina. The star is catalogued as GSC 08630-01117 (11h 36m 10s -53° 12' 15.04"). From the light curve the star should be an ELL-type variable. We computed the period $P = 0.6311 \pm 0.0002$ days. The maximum is 13.07 ± 0.02 mag and minimum is 13.22 ± 0.02 mag (in the Johnson V filter) with an amplitude of about 0.15 mag. We registered this star in the CzeV catalogue and in the VSX catalogue as new variable star CzeV603. Several transits of known exoplanets were observed by the FRAM telescope. These observations show the ability to detect new exoplanets using the FRAM telescope.
Keywords: variable star, light curve, FRAM, period analysis, exoplanet transit

Realistic reproduction of appearance of real-world materials by means of computer graphics requires accurate measurement and reconstruction of surface reflectance properties. We propose an interactive software simulation tool for modeling properties of a kaleidoscopic optical system for surface reflectance measurement. We use ray tracing to obtain fine grain simulation results corresponding to the resolution of a simulated image sensor and computing the reflections inside this system based on planar mirrors. We allow for a simulation of different geometric configurations of a kaleidoscope such as the number of mirrors, the length, and the taper angle. For accelerating the computation and delivering interactivity we use parallel processing of large groups of rays. Apart from the interactive mode our tool also features batch optimization suitable for automatic search for optimized kaleidoscope designs. We discuss the possibilities of the simulation and present some preliminary results obtained by using it in practice.

The presented article would like to contribute to a better orientation in the field of an optical elements surface defects evaluation according to in the recent time expanded ISO-10110-7 and MIL-0-13830A norms, that over time become the Acceptance test protocols usual part. In addition to the understandable basic concepts and assessment criteria explanation, concrete procedure examples of surface defects characterization in both reflectance and transmittance arrangement are also presented with regards to the application for aspheric surface shape evaluation.
Keywords: surface imperfection, scratch and dig analysis

In the paper the limit of grinded surface micro-roughness of brittle materials (optical glass) is experimentaly determined with regard to the ability to record and reconstruct the surface by digital holography with expected quality. Multiwavelength phase shifted digital holographic interferometry (holographic contouring) is used and its performance is examined in those test. Holographic contouring is great candidate for precise shape measurement technique which could be applied in optical element manufacturing process – mainly during the iterative process of generating. Selected artifact with different radii of the spherical (convex and concave) surface shapes were prepared with different micro roughness and its optical surfaces were recorded holographically in the designed setup. Two different measures were selected to help to estimate the quality of recording. First of them was the intensity profile of the reconstructed surface changing in connection with micro roughness decrease. The shape of the intensity profile develops as the surface is altering from strongly diffusive to almost specular. The second one was the correlation of recorded and reconstructed phases (surfaces shapes) where the recording was done with close wavelengths. The correlation function decreases in connection with the noise amount increase in the data. The preliminary results are displayed showing that the surface could be measured by multiwavelength holographic contouring up to very high quality of lapped surface – almost polished – nearly specular. On the other hand the application of holographic contouring to polished surface measurement is still challenging and remains unresolved even with the multidirection illumination.

The aim of the present article is to provide clear and user valuable information about aspheric surfaces measurements suitable for use in optical manufacture. In view of this a theoretical analysis of the surface shape criteria defining possibilities in accordance with ISO 10110 was compiled. Also the aspheric surfaces measurement operating procedures (measurement methodology) for aspherical stitching interferometer and 3D non-contact profilometer were compiled too with regard to the process key steps discussion. These procedures were then tested by the real aspherical surfaces samples measuring and the standard deviations of the results were determined.
Keywords: aspheric surface measurement

Resine bond grinding wheels are often used for the final grinding of precise aspheric optic. In this paper, the optimization of the circumferential speed of the resin bond grinding wheel with respect to the surface microroughness, the surface imperfections and also to the tool life time is presented. The optimum was searching in the interval of the circumferential speed from 12 m/s to 24 m/s and the wear of the tool was observing in the 1.9 hour intervals. The results of the experiment shows that, the optimum of the circumferential speed was found in the narrow interval around the speed 20 m/s. Out of this narrow interval the surface is affected by many undesirable properties so the accurate optimization of the machining parameters is very important when a resine bond grinding wheel is used.