

DETERMINATION OF LOCAL SURFACE DEFECTS  
USING A SHACK–HARTMANN  
WAVEFRONT SENSOR

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S u m m a r y

A modification of the wavefront registration scheme aimed at improving the spatial resolution of a sensor has been considered. A focused laser beam has been proposed for illuminating a researched surface area; after the optical transformation in a Fourier optics scheme, the beam forms a signal in the sensor plane, which could be considered as a phase image of the surface. The spatial resolution in the surface plane is determined in this case by the sensor aperture, rather than the spatial resolution of the sensor lenslet array. The theoretical analysis and the computer simulation of the wavefront sensor functioning aimed at revealing local defects on the light-reflective surface have been carried out. To reach the submicron spatial resolution of the sensor, the classification of surface microareas is proposed to be made using the methods of multivariate statistical analysis.