In photorefractive sight correction, pre-operational computations of to-be-ablated layers are usually based on information about cornea shape that is one of the causes of aberrations. To obtain high-quality results of operation, contributions to aberrations of other origins are to be taken into account. Technique of eye-aberration mapping has been investigated, we called retina ray-tracing. It consists in directing into the eye a narrow beam, scanned (translated) in parallel to itself. Computer controls trajectory of scanning. Beam projection (spot of light) is formed on the retina. Aberrations result in varying position of the spot on retina in the course of scanning. Deviations from initial position are measured and reconstructed into wave aberration function. Mathematical relations, using Zernike polynomial expansions, were found to transform these data into necessary cornea shape correction with ablation technologies. In our experimental setup, we used the technique of acousto-optic scanning with frame time less than 10 ms for 65 sensed points. Eye-aberration mapping is realized with optical power resolution 0.1 diopter.
Key words: photorefractive sight correction, retina ray-tracing, acousto-optic scanning, Zernike polynomials, ablation technology, eye-aberration mapping, wave aberration function.

Full article