S. Zakharovas, Stanislovasz@gmail.com, M. Suheimat, D. A. Atchison, E. J.

Lambert

Digital holographic microscope for recording structures human retina live 25

We present a digital holographic microscope for in vivo recording of the structures of the human retina. Existing eye imaging technologies cannot provide images with a resolution of less than 1 μm at a depth of up to several hundred micrometers. This can be improved with digital holography, since the eye hologram captured by a digital camera contains information on structures throughout the depth of the eye. This information can be reconstructed both

optically and numerically. The difficulties of holographic recording of the structures of the retina of the human eye in vivo are caused by the obvious fact that the objects to

be holographic are located behind the lens and cornea. Our hologram recording scheme uses the principles of an off-axis digital holographic microscope designed to study reflective

micro-objects. We use the cornea and lens of the human eye as a microscope objective. This allowed us to record in vivo digital holograms of the human retina with a reconstruction

resolution of less than 1 μm.

Keywords: Digital holography, holographic microscope, eye retina, cornea, eye lens, retinal image.