Diploma thesis abstract

“Anisoplanatism of human eye.”

Alexander V. Dubinin

scientific adviser:

Ph.D. Cherezova T.Yu.

In this work investigation of anisoplanatism of human eye is carried out. On the basis of experimental measurements of off-axis human eye aberrations isoplanatic angle for several subjects was calculated. Results were compared with ideal human eye model. An experiment carried out to measure corneal and internal optics aberrations is also described. On the basis of experimental data human eye models simulating on-axis and off-axis performance of the subjects’ eyes were developed. These models were used for investigation of isoplanatic patch widening methods. Results for average phase correction method when corrector compensates for the phase averaged between two reference sources are presented. Also a method based on neutralization of corneal surface refractive power by immersing the cornea in liquid is proposed. It was shown that this method is quite effective and can be used for widening the field-of-view of ophthalmologic devices equipped with adaptive optics. Investigation of isoplanatic patch widening method using adaptive optics system with several correctors is performed. On the basis of calculations for Navarro model eye using ZEMAX software a possibility of isoplanatic patch widening by means of several wavefront correctors is demonstrated. Also differences between such a system and multiconjugate adaptive optics systems (MCAO) used for compensation of aberrations induced by atmospheric turbulence are pointed out.