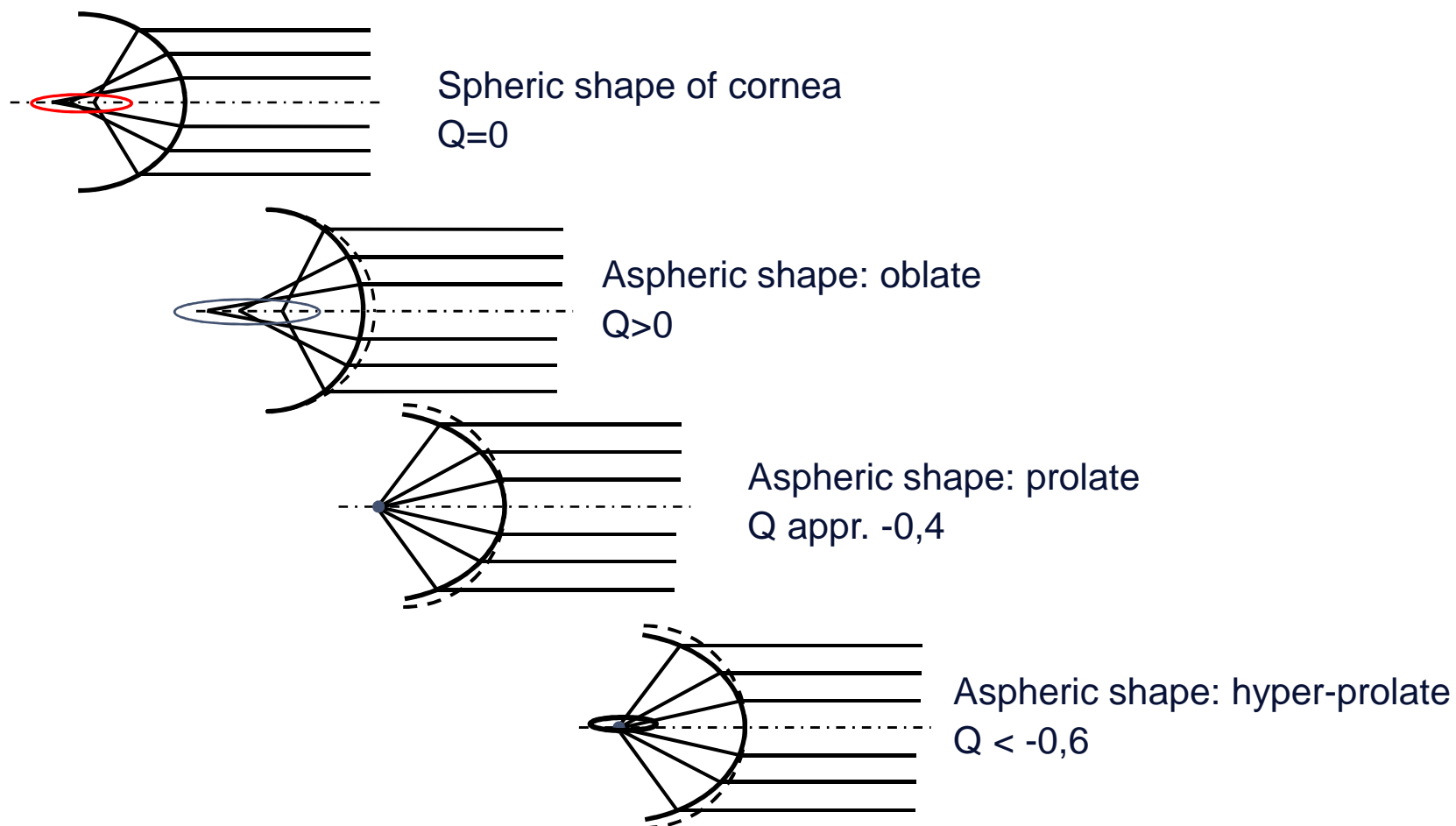


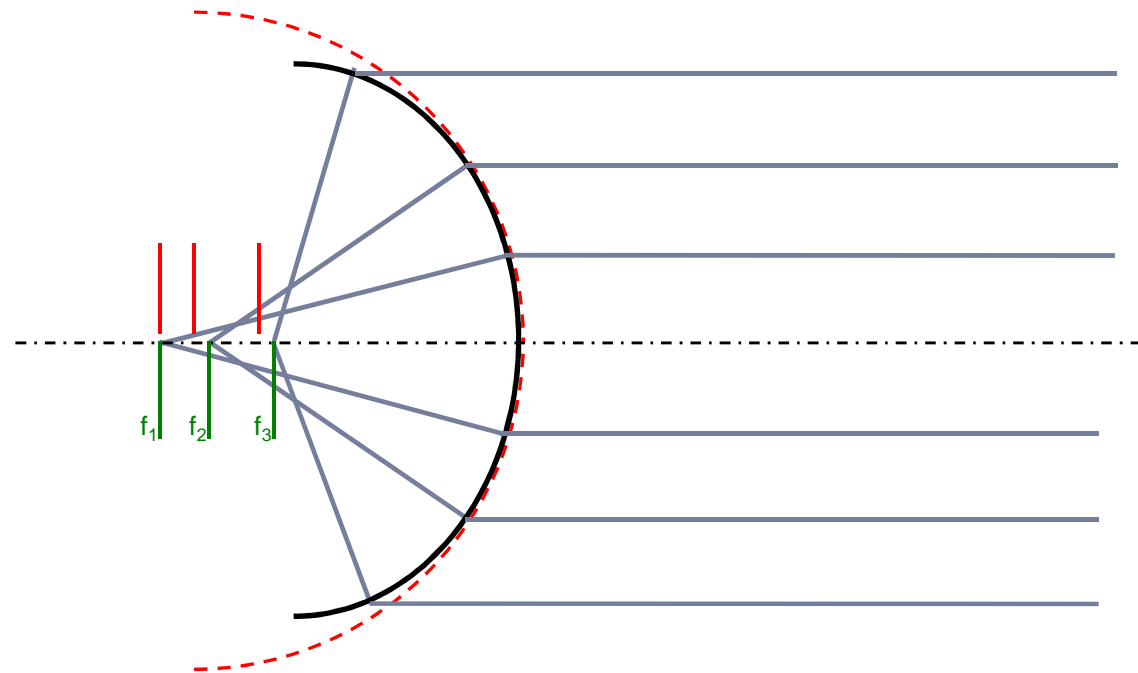
ALLEGRETTO Wave Eye Q



Custom Q: Change of Corneal Asphericity



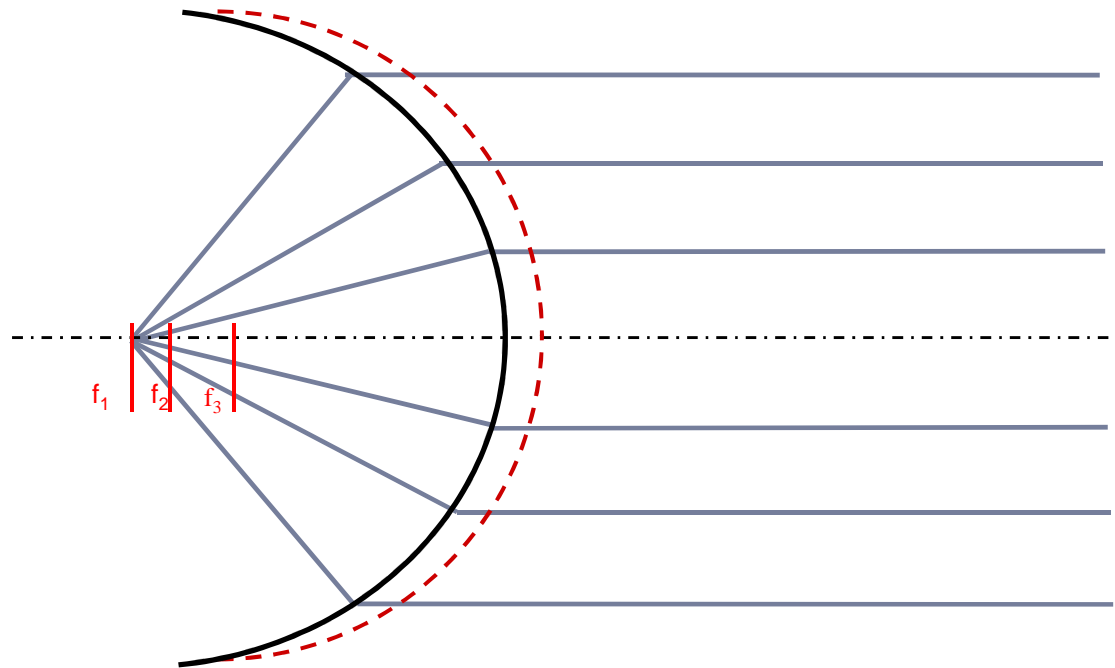
The oblate shape - Corneal Asphericity ($Q > 0$)



Changing a spherical optic into an aspheric (here: oblate) shape:

The central radius remains almost unchanged (no refractive correction), the radius of curvature is getting smaller towards the periphery.

Positive spherical aberrations are increasing.

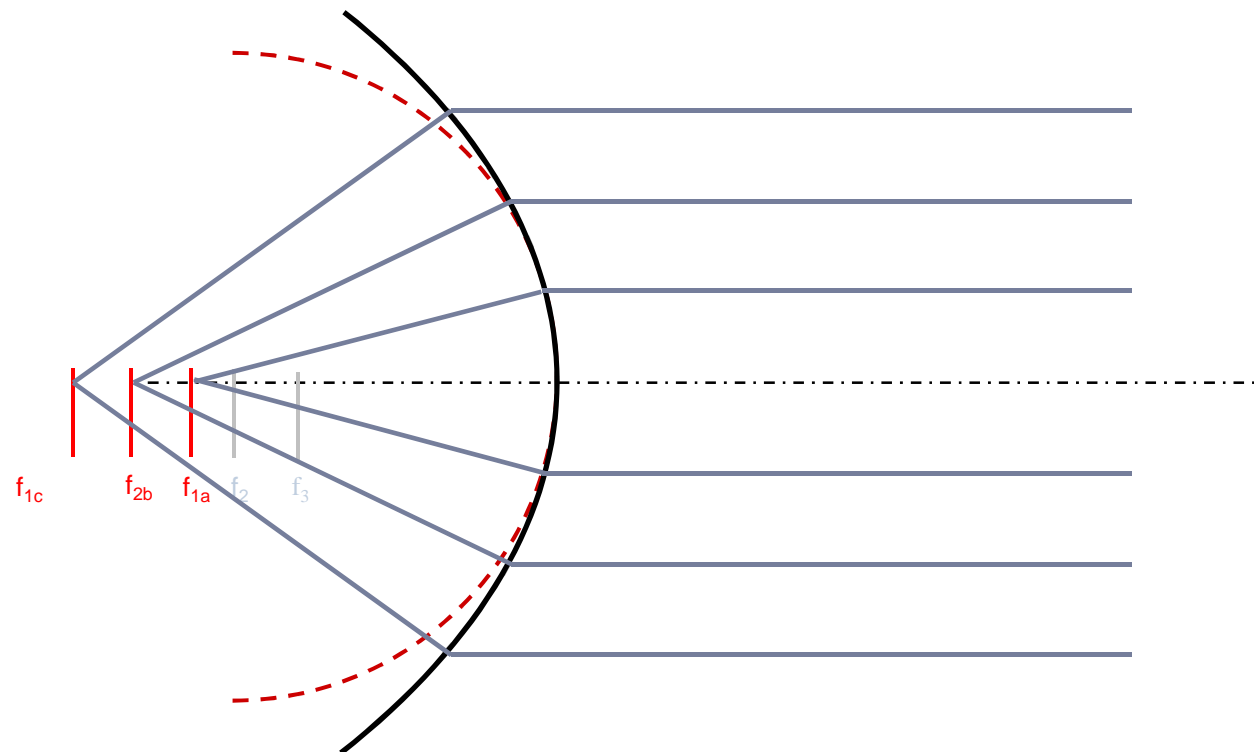
The prolate shape ($Q < 0$)

Changing an spherical optic into an aspheric (here: prolate) refractor:

The central radius remains almost unchanged (no refractive correction), the radius of curvature is getting larger towards the periphery.

Spherical aberrations are reduced.

Hyperprolate cornea



Change of a spherical shape into a hyperprolate shape:

The central radius remains almost unchanged, but the radius of curvature is getting larger towards the periphery.

Negative spherical aberrations are induced.

Presbyopia: Principle of Advanced Monovision

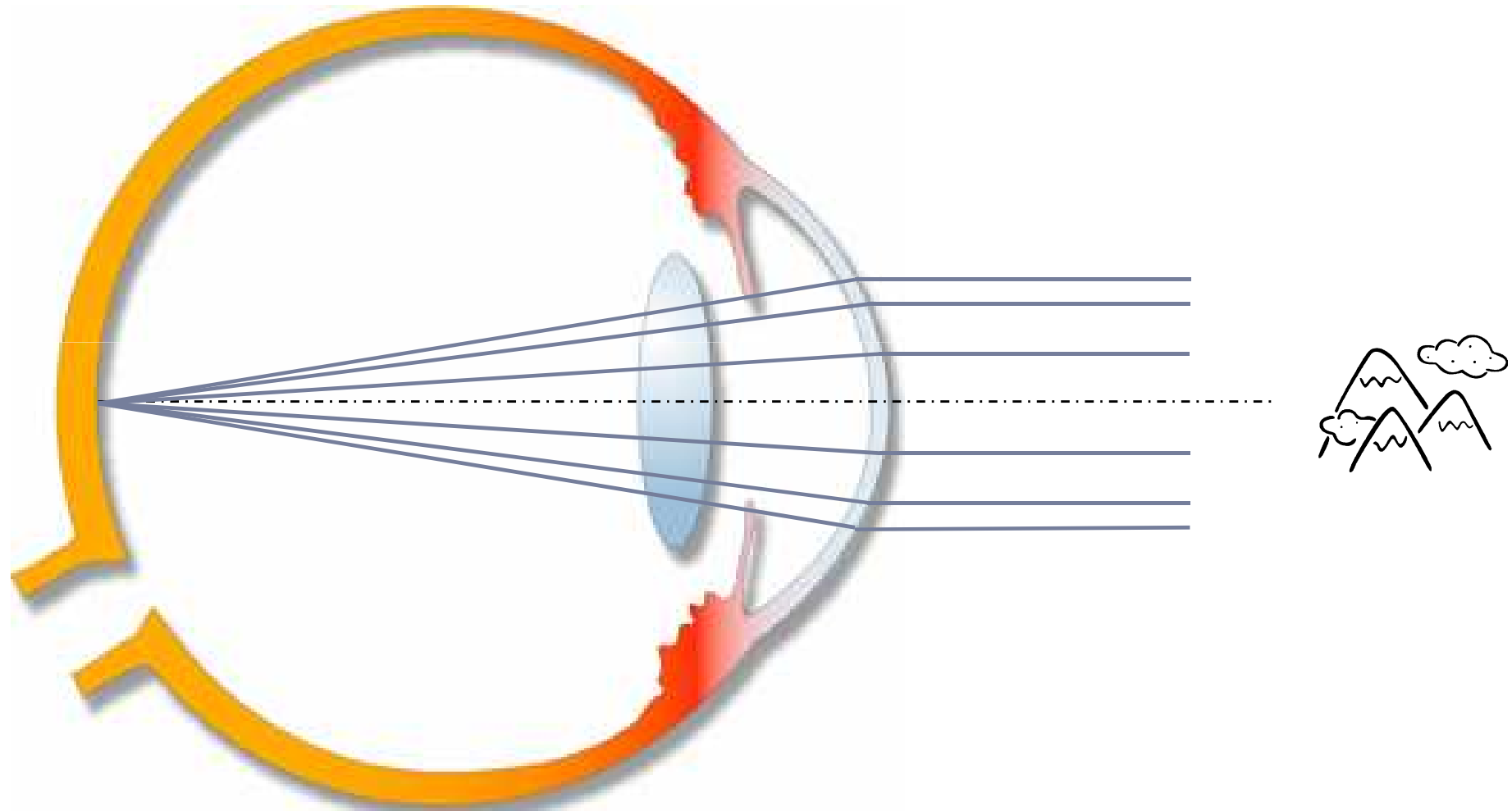


- Correct the dominant eye for distance vision
- Correct the nondominant eye for near vision

AND

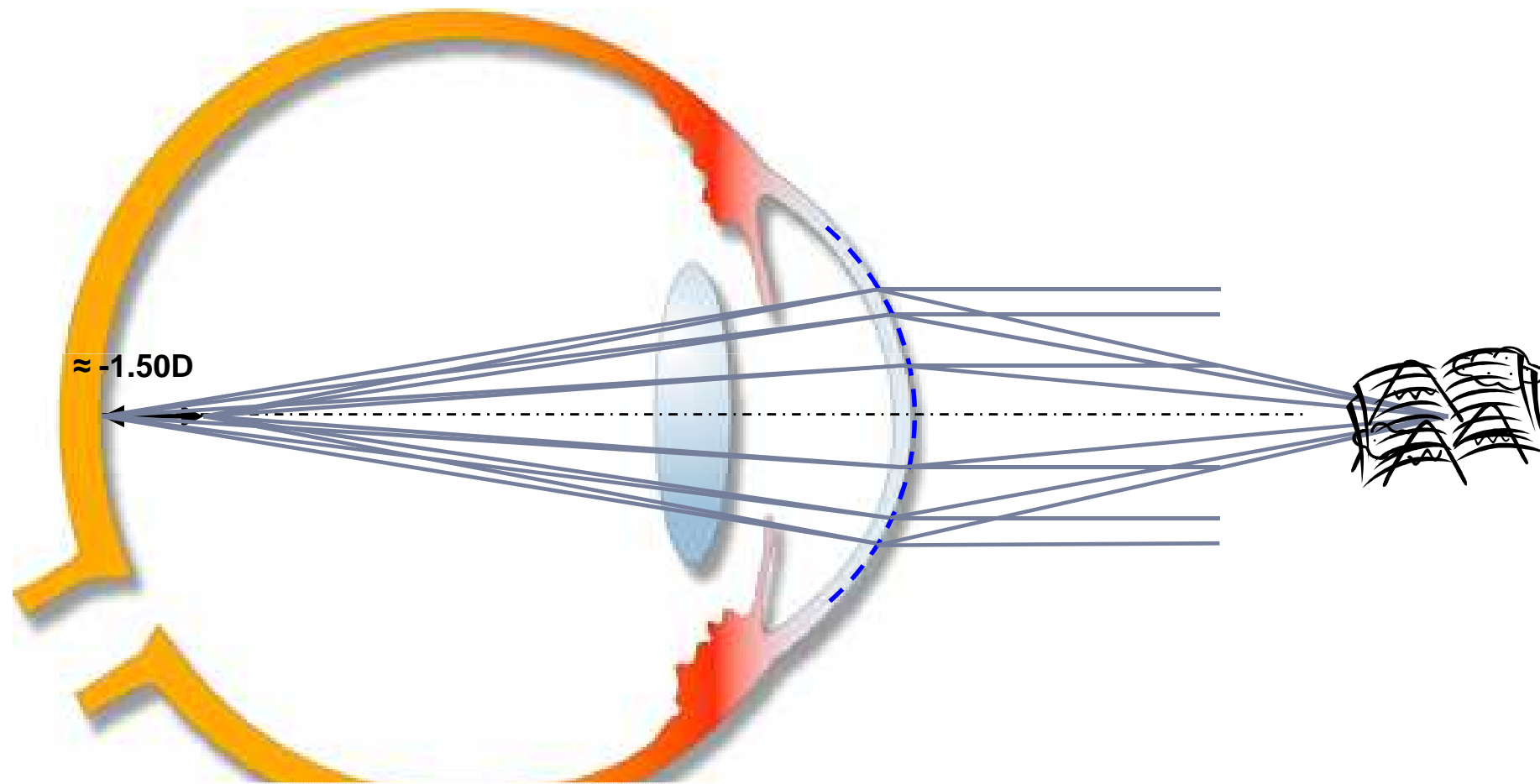
- Aim for a hyperprolate cornea (extremely negative Q-value) for the nondominant eye
- Consider the Miosis for improvement of near vision quality
- Apply the presbyopia nomogram (Refraction, Q-Factor, Miosis)

Emmetropic Eye



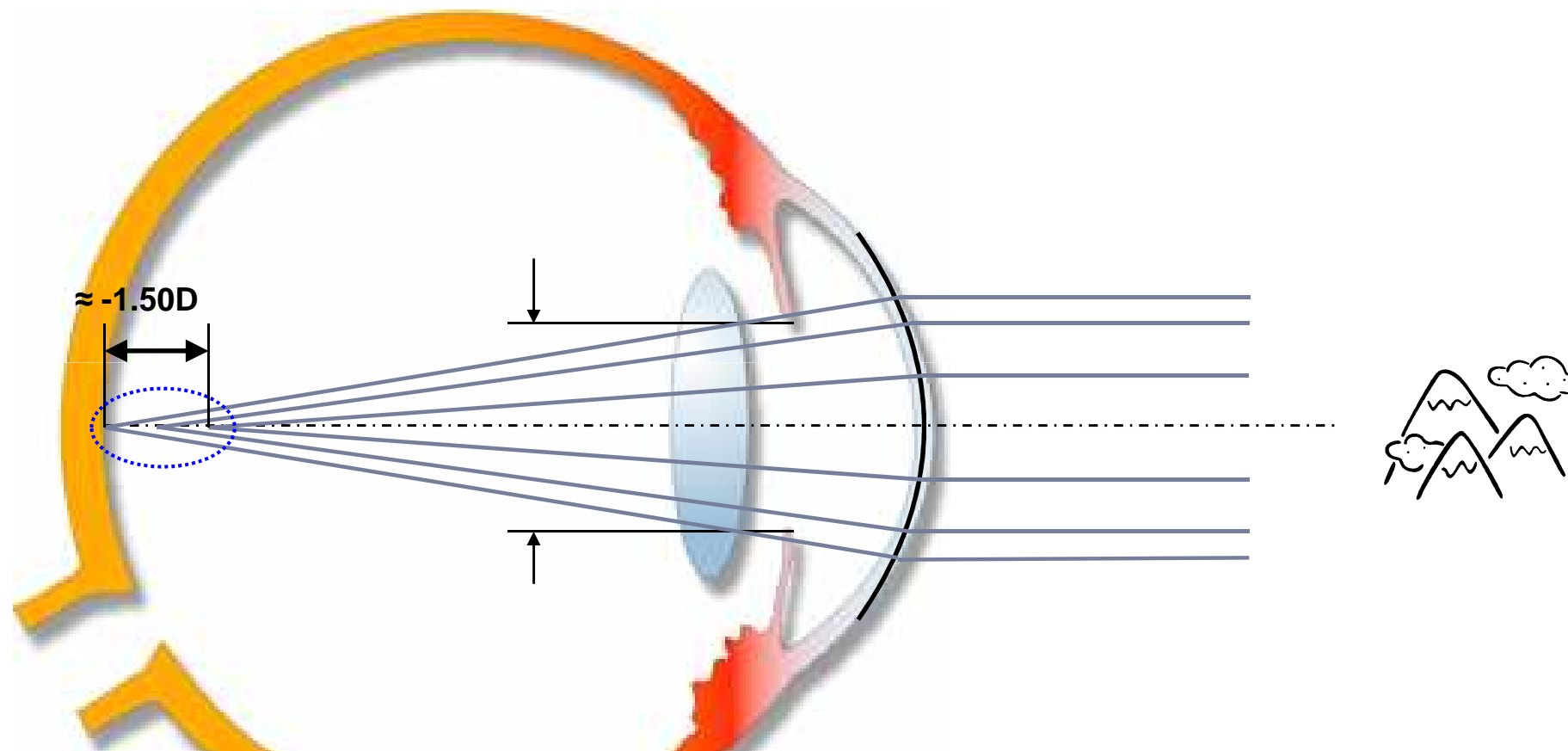
An object at infinity is in sharp focus with the eye lens in a neutral or relaxed state.

Myopic Eye (Monovision)



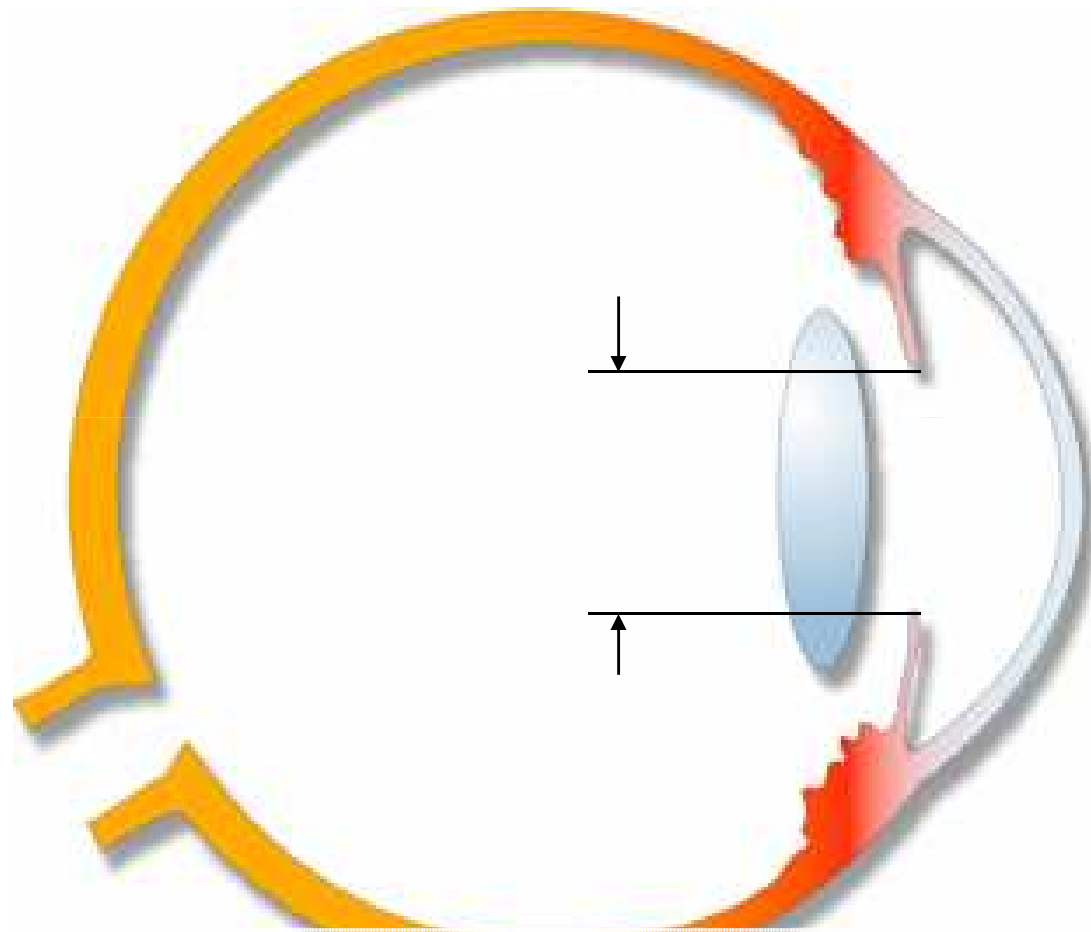
In order to reduce the need for bifocals or reading glasses, the non-dominant eye will be corrected for near vision. This method is called "monovision"

Monovision + Hyperprolate cornea
for distance vision (large pupil)



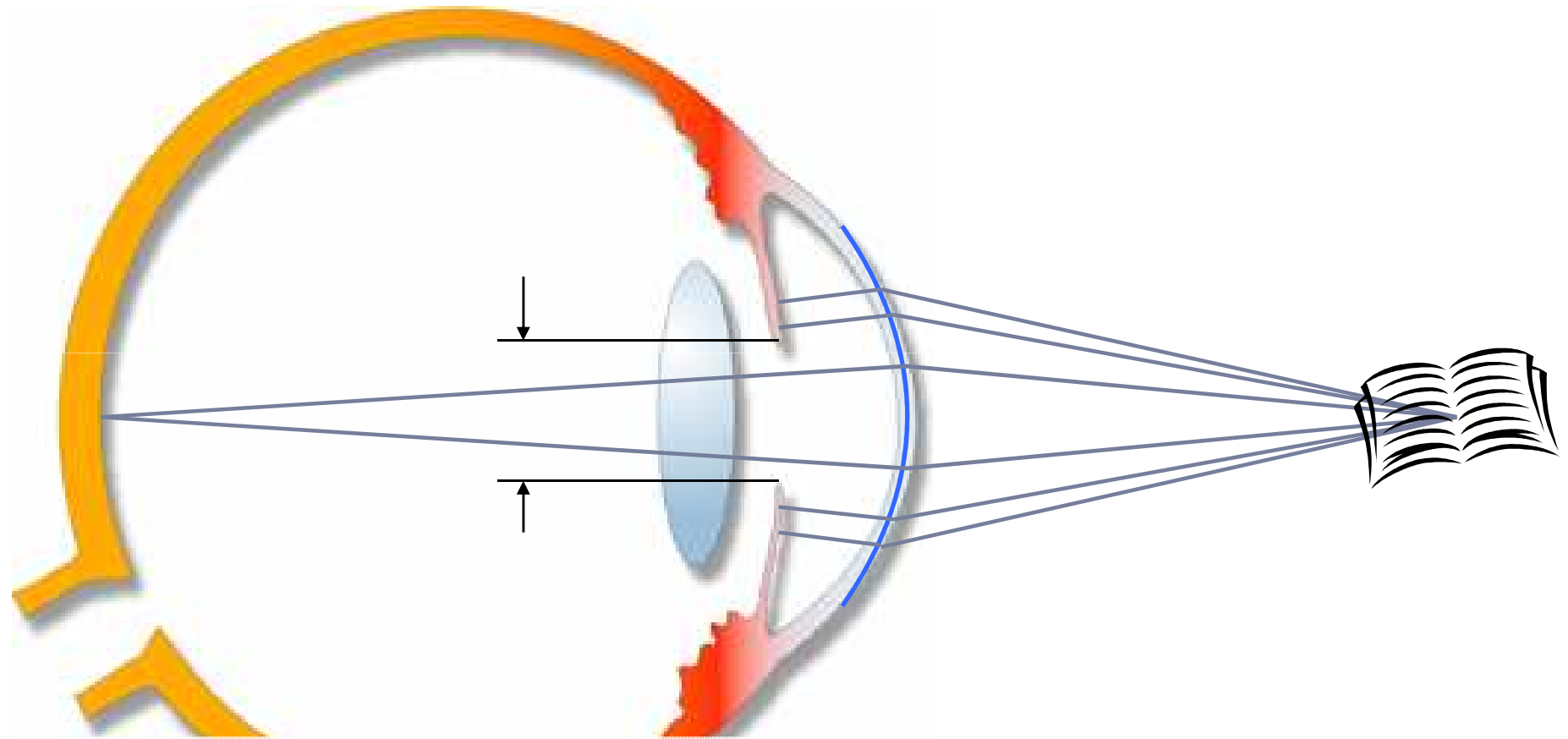
The combination of monovision (central rays are focused in front of the retina) and a hyperprolateness of the cornea (peripheral rays are focused behind the central rays) creates a larger depth of field.

Accomodation and Miosis



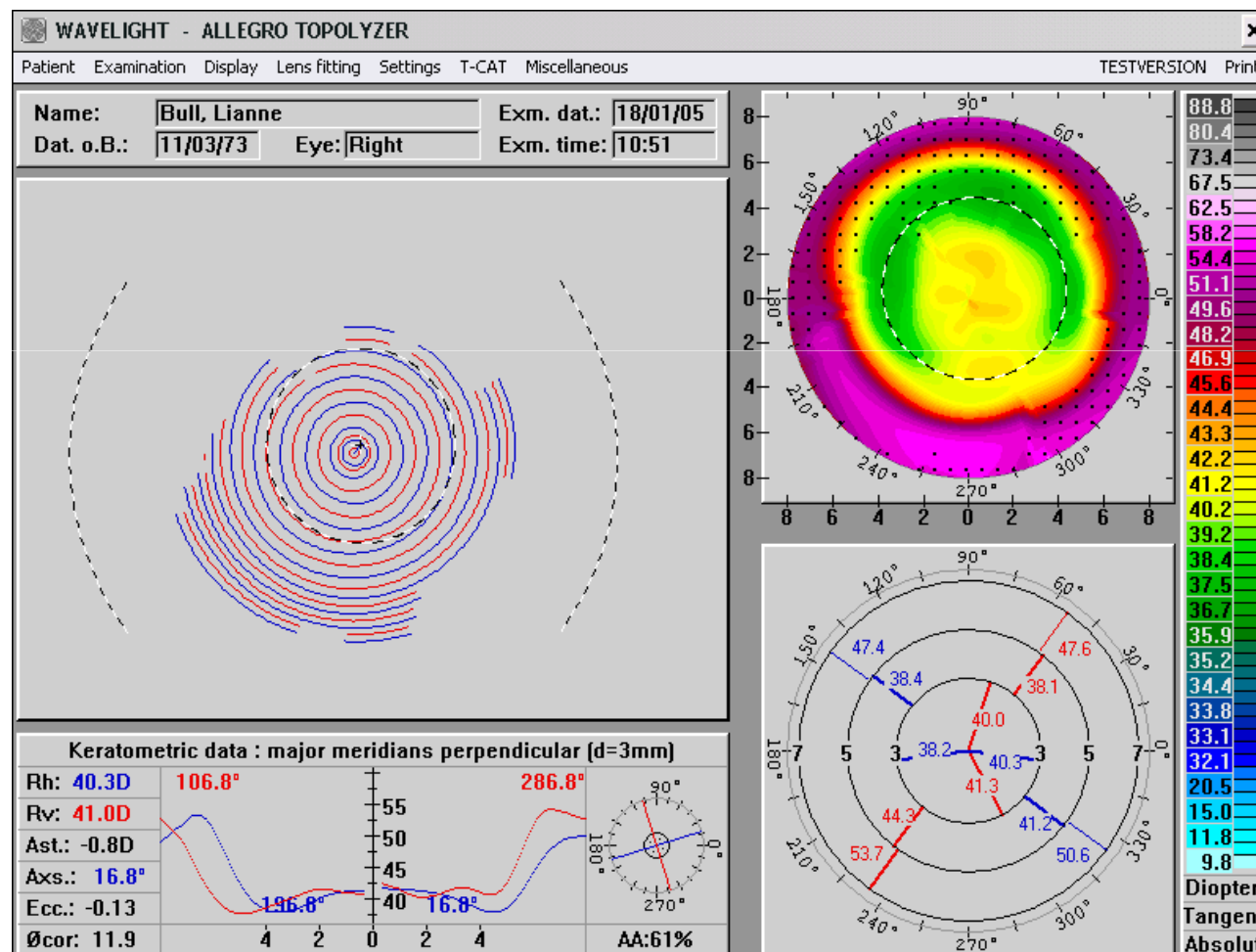
When the eye focuses on the near field (acommodation) the pupil will constict. This is called miosis.

Monovision + Hyperprolate cornea
for near vision (miosis → small pupil)



The effect of the miosis is utilized in the advanced monovision procedure. It excludes the peripher rays, so that only the central rays are now focused on the retina.

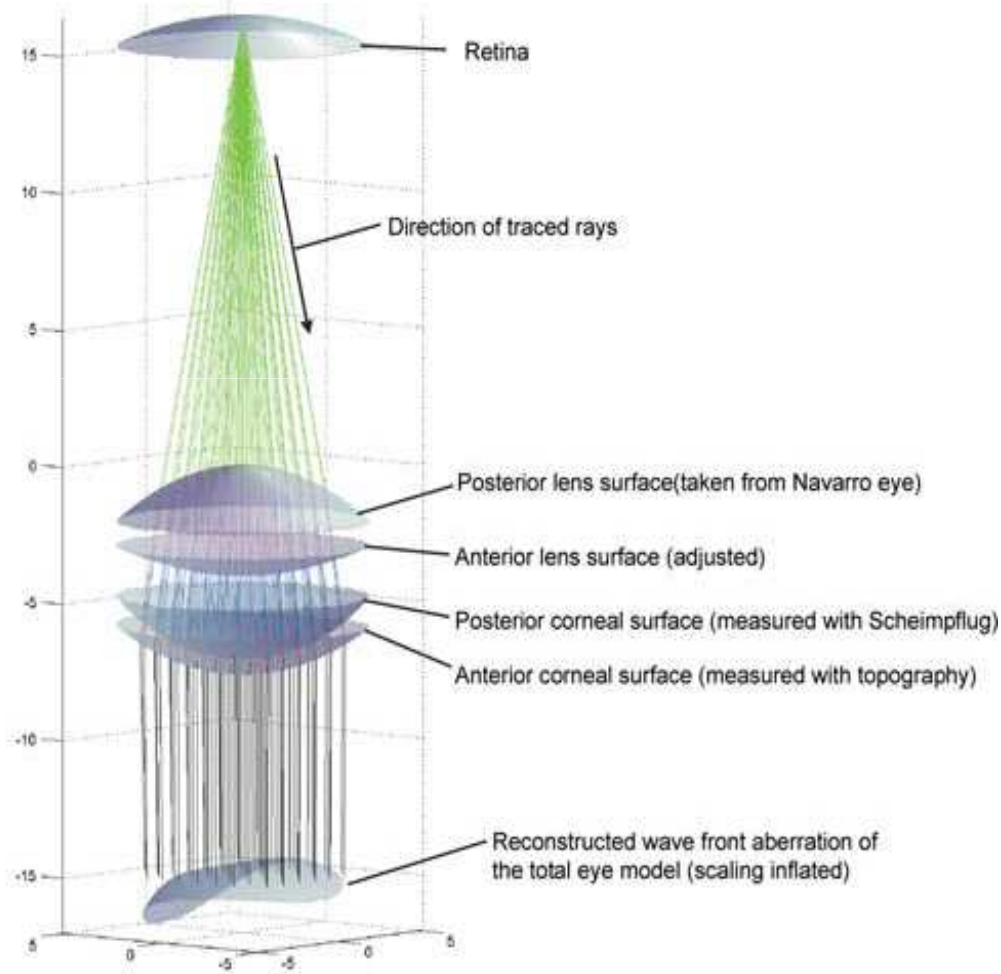
Advanced Monovision





Future: Ray Tracing, Ultraflap

Ray-Tracing (the future)



Topography-, wavefront- and Biometry is used to replace the average eye model with real measured values