

Lab 2 Feedback

In Lab 2, we measured the horopter using the **AFPP** technique. What is a **horopter**?

- Set of points in space that stimulate **corresponding points** on the two retinas and which have **zero binocular disparity**.

The horopter helps us understand how the binocular system has been designed to allow for **sensory fusion** of the images seen by the two eyes. In theory, the horopter ought to be the same as the **Vieth-Müller Circle (VMC)**. What's the Vieth-Müller Circle? It is the theoretical horopter based on the assumptions that the ...

- eyes are circular in horizontal cross section;
- nasal-temporal symmetry of oculocentric visual directions;
- OD-OS symmetry.

Empirical horopters usually don't match the VMC. None of the ones we measured did.

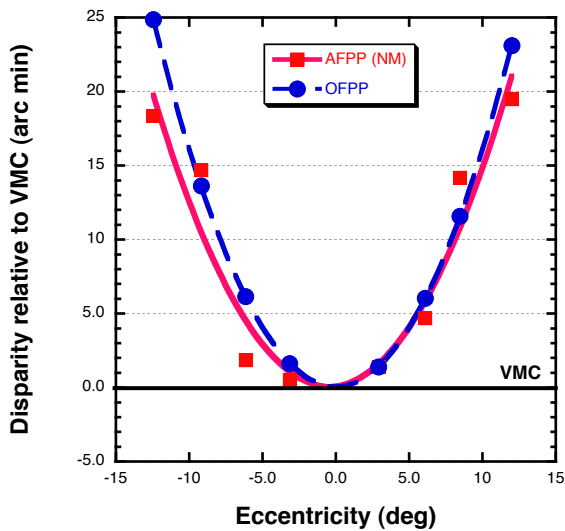


Figure 1. One horopter that almost exactly matches the OFPP. What is the OFPP? This horopter was probably measured at the **abathic distance** for this subject. Why is the VMC plotted as a straight line?

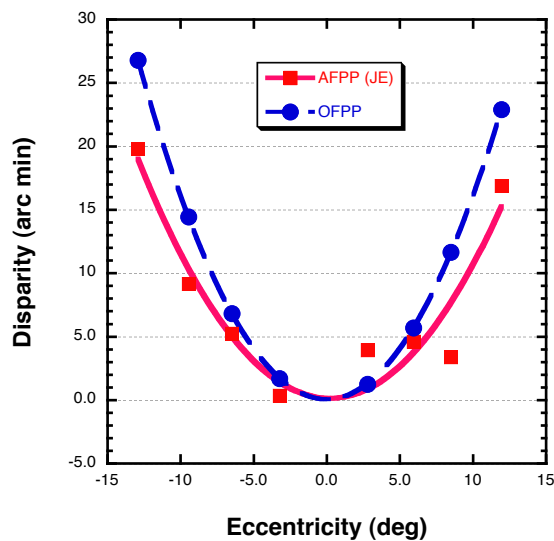


Figure 2. Most of the AFPP plots looked like this.

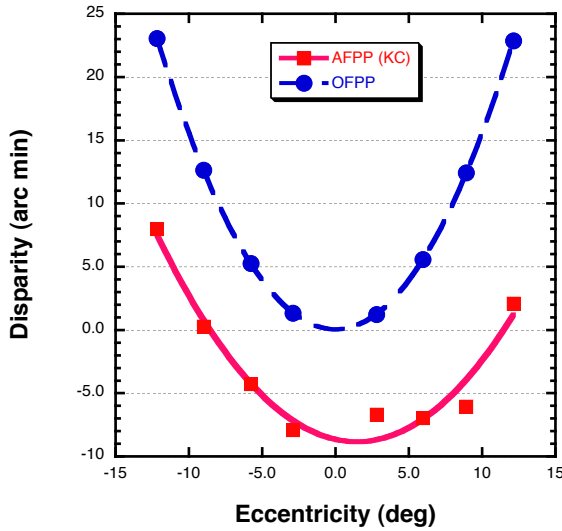


Figure 3. Note the difference between this plot and the others above: It's well below the VMC and has a slight tilt. This shows an eso fixation disparity and slight magnification OD.

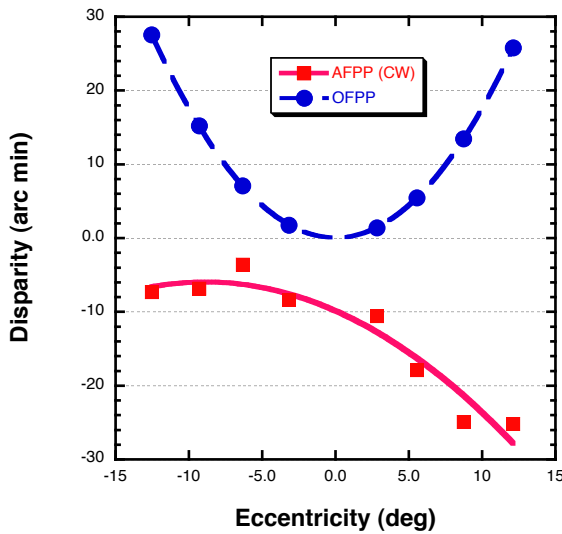


Figure 4. Another horopter shifted downward and tilted. This shows an eso fixation disparity and magnification OD.

In all cases, the plots did not match the VMC. That is, there is a **Hering-Hillebrand deviation**. Specifically why were,

- all empirical horopters were more curved than the VMC plot?
- Why were some shift up or down away from zero?
- Why are horopters sometimes tilted?

The answers to these questions are found in the last part of the Lecture 6 notes. These things can be caused by

- nasal-temporal asymmetry of retinal (oculocentric) visual directions;
- fixation disparity;
- unequal size retinas or unequal sized retinal images (aniseikonia).

Note that greater magnification of the OD image causes a plane to appear to be tilted away from OD (Lecture 6, Figure 6).