Reply to comment on: Rethinking the optimal methods for vector analysis of astigmatism

We appreciate Dr. Alpins' comments and are pleased to respond. We do want to acknowledge how accessible and easy to use his system is. That is a goal to which all complex methods of analysis should aspire, and it is what we tried to accomplish with the Astigmatism Double-Angle Plot, Corneal SIA, and IOL Calculation Formula Analyzer tools developed by Dr. Abulafia and now available on the ASCRS, ESCRS, and JCRS websites.

Our premise is that the complicated topic of astigmatism analysis requires methods of analysis that accurately convey the results and the deviations from the intended target. We hold to our concerns about some of the ASSORT® displays, specifically:

1. The Assort double-angle plots are double-angle plots that, instead of using the correct 180-degree labeling, are mislabeled with 360-degree labeling, which will cause the reader to misinterpret the results and certainly will not help readers understand the concept of doubling the angles.
2. Univariate plots of vector magnitudes and angles that are not helpful because one cannot link magnitude errors to the angles of these vectors. Dr. Alpins said, of the outlier values that we illustrated: "Such cases would always need to be examined comprehensively to determine the underlying cause." But that is precisely our point: Without knowing both magnitude and angle of any given data point, one cannot know which data need to be examined further.
3. The correction index that is confusing and could lead to adjustments in treatment parameters that will worsen outcomes. Our 2 cases demonstrate this. Dr. Alpins states of the correction index, "A quick glance then allows the surgeon to see whether there are differences in effect between with-the-rule, against-the-rule, and oblique treatments." That is certainly not true of our cases. For example, the case with the oblique error has the correction index plotted along 180 degrees, when the error is in fact at 148 degrees. The correction index angle for this sample case is simply incorrect.

Authors who choose to use these particular ASSORT displays do so at the risk for not truly characterizing or even misconstruing what occurred. Journal standards need to be accurate and informative. We recognize that there is room for further development of optimal means of displaying and statistically analyzing astigmatic outcomes and look forward to continuing this exploration with the many colleagues who have contributed so much.

Douglas D. Koch, MD
Li Wang, MD, PhD
Jack T. Holladay, MD
Cullen Eye Institute, Department of Ophthalmology, Baylor College of Medicine, Houston, Texas
Adi Abulafia, MD
Department of Ophthalmology, Shaare Zedek Medical Center, Affiliated to Hadasa Faculty of Medicine, The Hebrew University, Jerusalem, Israel
Warren Hill, MD
East Valley Ophthalmology, Mesa, Arizona

Corresponding author: Douglas D. Koch, MD
Cullen Eye Institute, Baylor College of Medicine, 6565 Fannin NC 205, Houston, TX 77030.
Email: dkoch@bcm.edu.

Disclosures: *D.D. Koch is a consultant for Alcon Laboratories, Carl Zeiss Meditec, Johnson & Johnson Surgical Vision, and Perfect Lens. L. Wang is a consultant for Alcon and Carl Zeiss Meditec. A. Abulafia is a consultant for Alcon Laboratories, Carl Zeiss Meditec, and Haag Streit. J.T. Holladay is a consultant to Alcon Laboratories and Carl Zeiss Meditec.*

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Comment on: Distinct differences in anterior chamber configuration and peripheral aberrations in negative dysphotopsia

The study by van Vught et al. describes how eyes with clinical negative dysphotopsia have smaller pupils than control eyes, with the pupil displaced more temporally.[1] This is consistent with the fundamental cause of "bothersome" negative dysphotopsia, being due to the focused image becoming dark in the periphery because of vignetting at the edge of the intraocular lens (IOL) optic.[2] Light can also bypass the IOL and illuminate the retina more peripherally, and when the pupil is small, this can theoretically lead to a distinct "shadow" appearance in the gap between the 2 illuminated regions (Figure 1). The shadow fades as the pupil diameter increases.

Another recent article examines the same topic from a theoretical perspective.[3] Imaging characteristics in the far periphery that might make a shadow bothersome to a patient are illustrated, and limitations in the clinical data and the measurement methods are discussed. The description gives a clear hypothesis for the cause of one particular type of negative dysphotopsia, which might be called limiting negative dysphotopsia (or some other suitable name). This corresponds to many clinical reports of negative dysphotopsia, including earlier publications and evaluations, with Figure 3 in the study by Osher illustrating that the shadows are perceived by patients to be in the very far periphery, with a military salute obstructing the light source that causes them.[4] Unfortunately, actual angles for bothersome shadows have rarely been given in any publication, which makes it difficult to specifically test the hypothesis.

More recently, measurements made using perimetry have found additional shadowlike effects at many lower visual angles, but it is not clear whether these are also particularly bothersome or whether they are perhaps nuances of the visual field at lower angles that have not