# Vector analysis with the femtosecond laser

The paper by Kunert et al.,[1] using vector analysis in patients receiving refractive lenticule extraction with a femtosecond laser has generated criticism related to attribution[2,3] and interpretation.[4] In their replies to these letters,[2–4] Kunert et al. were straightforward in acknowledging shortcomings and defending their methods and analyses. However, as the author of the basic analytic techniques used in the study, as well as the original terminology used in the approach,[5–8] I believe the replies were insufficient and that additional clarifications are needed.

Kunert et al.[1] wrote that the vector analysis in their study "was calculated on the refractive data that mainly followed the definitions and formulas given by Eydelman et al."[9] comprised for the Astigmatism Project Group of the American National Standards Institute and according to the then editor of the *Journal of Refractive Surgery*, the 2006 publication was a "Special Article" that did "not qualify for peer review."[10] A critical reading of this non-peer-reviewed paper reveals the obvious conclusion that the formulas and definitions were not "given" by Eydelman et al.; in fact, the formulas duplicated those from my previous publications and the definitions were minor and unnecessary rewording of those I published previously.[5–8]

Kunert et al.[1] perpetrate a further oversight in describing the "different approaches" that have been published to derive a nomogram for astigmatism correction. They correctly note that I proposed the use of a coefficient of adjustment (CA),[7] defined as the ratio of the intended to the induced astigmatism. They go on to write that the CA corresponds to the inverse of the correction ratio (CR) as defined by Eydelman et al.[9] The CR described by Eydelman et al.[9] is, in fact, a minor rewording of my previously described correction index.[6,7]

Although the non-peer-reviewed paper by Eydelman et al.[9] does not seem to have been widely cited thus far, it concerns me that it may become a de facto standard for astigmatism analysis. Others have noted the inadequacy of its referencing.[11,12] Its use of nonzero targets was described in my 1993 publication,[5] and the terminology it offers reflects minor rewording of terms defined many years previously, and thus only foments confusion among those who wish to use or report vector-based astigmatism analysis in a consistent way. The intent of the original Astigmatism Project Group was to provide a regulatory framework for reporting and evaluating laser systems to treat astigmatism and would more appropriately have been published in a governmental bulletin of some kind.

These issues have been addressed in past correspondence and editorials[8,11–15] generated by Eydelman et al.[9] It is unfortunate that potentially good science can be overshadowed by neglecting the fundamentals of accurate sourcing and reporting of data. I am disappointed that during the 6-month review period of the Kunert et al.[1] paper, reviewers did not bring these deficiencies to the authors' attention. The net result of systematic failures such as happened here is that authors and their articles become notable for all the wrong reasons.

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## REFERENCES

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*Editors Note: We agree: It is important to recognize and reference Alpins[5] pioneering work in this area and particularly the analytical system that he developed, a modified version of which was described by Eydelman et al. For purposes of clarity and consistency with the majority of papers that use this type of analysis, we recommend that authors use Alpins[5] original terms and equations.*