

ASSORT Group Analysis Calculator: A Benefit for the *Journal of Refractive Surgery* and ISRS Members



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Much has been written about astigmatism analysis over the past 25 years.¹⁻⁹ Even low amounts of residual or induced astigmatism can reduce visual quality¹⁰⁻¹²; thus, proper vector analysis remains germane to both clinicians and researchers. The topic is particularly relevant today given the surge of surgical options for astigmatic correction available at the refractive, corneal, and lens planes.

As with any procedure, appropriate data analysis is critical to evaluate current outcomes and to determine the optimal adjustments to improve future outcomes. There remains a gap between what is measured and what is reported in the literature, likely due at least in part to the perceived barrier for creating advanced statistical analyses.

To lower this barrier, we now have the ASSORT platform available for use for all members of the International Society of Refractive Surgery (ISRS) and authors reporting astigmatic outcomes in the *Journal*. This software has been graciously provided by Professor Alpíns and surely represents a major step forward in our ability to report, and therefore understand, the impact of our treatments on astigmatism.

As stated on the ISRS web site, the ASSORT Group Analysis Calculator (<https://www.isrs.org/resources/assort-website-calculators>) provides unlimited astigmatism analysis using the Alpíns Method. This program, made available to ISRS members, can greatly facilitate submissions to the *Journal of Refractive Surgery* with the ability to import data and export the appropriate vectorial analyses in both numerical and graphical reports. This calculator generates group analyses and the *Journal of Refractive Surgery* standard graphs for astigmatism.¹³⁻¹⁸

Users are able to choose from three separate analysis methods: refractive analysis to analyze changes in refractive cylinder, corneal analysis to analyze changes in corneal astigmatism, or toric intraocular lens

analysis to analyze outcomes of toric intraocular lens implantation.

The data sheets are downloadable and self-explanatory regarding the variables needed for data entry. There is also an option for manual data entry directly into the system if that is preferable. A 12-minute instructional video is available on the site. Use of the new calculator is straightforward, but the video should make it even easier. There are numerous studies that serve as great examples for astigmatic outcomes reporting; for those readers less familiar with the standard graphs, examples can be found in recent articles by Pérez-Izquierdo et al.,¹⁹ Reinstein et al.,²⁰ and Wallerstein et al.²¹

We hope that our members and authors take advantage of this great tool and the opportunity it provides to completely analyze and report astigmatic outcomes and that our readers appreciate the added information it provides when evaluating procedures and techniques.

REFERENCES

1. Alpíns NA. Vector analysis of astigmatism changes by flattening, steepening, and torque. *J Cataract Refract Surg*. 1997;23:1503-1514.
2. Alpíns NA. A new method of analyzing vectors for changes in astigmatism. *J Cataract Refract Surg*. 1993;19:524-533.
3. Alpíns N. Astigmatism analysis by the Alpíns method. *J Cataract Refract Surg*. 2001;27:31-49.
4. Kaye S, Patterson A. Assessing surgically induced astigmatism. *J Cataract Refract Surg*. 2001;27:1148.
5. Holladay JT, Moran JR, Kezirian GM. Analysis of aggregate surgically induced refractive change, prediction error, and intraocular astigmatism. *J Cataract Refract Surg*. 2001;27:61-79.
6. Thibos LN, Horner D. Power vector analysis of the optical outcome of refractive surgery. *J Cataract Refract Surg*. 2001;27:80-85.
7. Naeser K, Hjortdal J. Polar value analysis of refractive data. *J Cataract Refract Surg*. 2001;27:86-94.
8. Alpíns N. Terms used for the analysis of astigmatism. *J Refract Surg*. 2006;22:528.
9. Alpíns N, Ong JK, Stamatelatos G. New method of quantifying

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- corneal topographic astigmatism that corresponds with manifest refractive cylinder. *J Cataract Refract Surg.* 2012;38:1978-1988.
10. Watanabe K, Negishi K, Kawai M, Torii H, Kaido M, Tsubota K. Effect of experimentally induced astigmatism on functional, conventional, and low-contrast visual acuity. *J Refract Surg.* 2013;29:19-24.
 11. Villegas EA, Alcón E, Artal P. Minimum amount of astigmatism that should be corrected. *J Cataract Refract Surg.* 2014;40:13-19.
 12. Hasegawa Y, Hiraoka T, Nakano S, Okamoto F, Oshika T. Effects of astigmatic defocus on binocular contrast sensitivity. *PLoS One.* 2018;13:e0202340.
 13. Waring GO. Standardized data collection and reporting for refractive surgery. *Refract Corneal Surg.* 1992;8:1-42.
 14. Waring GO 3rd, Reinstein DZ, Dupps WJ Jr, et al. Standardized graphs and terms for refractive surgery results. *J Refract Surg.* 2011;27:7-9. Erratum in: *J Refract Surg.* 2011;27:88.
 15. Dupps WJ Jr, Kohnen T, Mamalis N, et al. Standardized graphs and terms for refractive surgery results. *J Cataract Refract Surg.* 2011;37:1-3.
 16. Reinstein D, Archer T, Randleman J. JRS standard for reporting astigmatism outcomes of refractive surgery. *J Refract Surg.* 2014;30:654-659. Erratum in: *J Refract Surg.* 2015;31:129.
 17. Reinstein DZ, Archer TJ, Srinivasan S, et al. Standard for reporting refractive outcomes of intraocular lens-based refractive surgery. *J Cataract Refract Surg.* 2017;43:435-439.
 18. Reinstein DZ, Archer TJ, Srinivasan S, et al. Standard for reporting refractive outcomes of intraocular lens-based refractive surgery. *J Refract Surg.* 2017;33:218-222.
 19. Pérez-Izquierdo R, Rodríguez-Vallejo M, Matamoros A, et al. Influence of preoperative astigmatism type and magnitude on the effectiveness of SMILE correction. *J Refract Surg.* 2019;35:40-47.
 20. Reinstein DZ, Carp GI, Archer TJ, Day AC, Vida RS. Outcomes for mixed cylinder LASIK with the MEL 90® excimer laser. *J Refract Surg.* 2018;34:672-680.
 21. Wallerstein A, Caron-Cantin M, Gauvin M, Adiguzel E, Cohen M. Primary topography-guided LASIK: refractive, visual, and subjective quality of vision outcomes for astigmatism ≥ 2.00 diopters. *J Refract Surg.* 2019;35:78-86.