

# Refractive, corneal, and ocular residual astigmatism: distribution in a German population and age-dependency: the Gutenberg health study

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Dear Editor,

There is much interest in the paper that appeared online in Graefe's Archive for Clinical and Experimental Ophthalmology by Karl-Georg Schuster A, Pfeiffer N, Schulz A et al. examining the Ocular residual astigmatism (ORA) of 13,558 healthy astigmatic eyes [1]. The ORA is a parameter introduced in 1997 [2] quantifying the vectorial difference between corneal and refractive (corneal plane) astigmatism measures. In normal eyes the ORA typically ranges from 0.73 to 0.81 dioptres [2, 3]. The ORA can be higher in more irregular corneas such as in those with keratoconus (1.34D) [4].

The ORA, like all vectors, can only be positive, a convention confirmed by Jaffe and Clayman in their description of surgically induced astigmatism (SIA) in 1975 [5]. A calculated negative vector requires reversal of polarity to render it positive and meaningful. In practical terms, a pilot would not radio his position as -200 km south of an airport when in fact he was situated 200 km north.

It appears that this paper and its examination of ORA did not adhere to this convention, creating confusion for the reader

and a potential misinterpretation of the findings, which is unfortunate since the study is a valuable one for comparisons with other studies that comply with sign convention, using the ORA and other vectors in the manner they were developed [6–9].

As a result of calculating a negative ORA, the summated vector mean axis of the ORA was found to be 90 degrees in this study [1] when in other series including our own it is usually 180 degrees [2–4, 6–9].

It would be helpful for this paper to be modified at this late stage by expressing the ORA in positive terms to be consistent with other papers the authors wish it to be compared with. Future publications would benefit from the same guiding principles so that a common sign convention can be maintained.

## References

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