

The *R* package *isocir* for Isotonic Inference for Circular Data. Applications to Problems Encountered in Cell Biology.

Sandra Barragán^{1,*}, Cristina Rueda¹, Miguel A. Fernández¹, Shyamal D. Peddada²

1. Universidad de Valladolid, Spain.

2. National Institute of Environmental Health Sciences, USA.

*Contact author: sandraba@eio.uva.es

Keywords: Circular Data, Isotropic Order, *CIRE*, Conditional Test, R package *isocir*.

Estimation of angular parameters when they are intrinsically ordered around a unit circle is a question of great interest for several researchers. Standard statistical methods, developed for Euclidean parameter space, are not directly applicable for circular data. Particularly, in the presence of restrictions among the parameters, estimators and hypotheses tests of hypotheses have to be properly defined in order to cope with the peculiarities of circular data. Motivated by applications to problems encountered in cell biology, [Rueda et al. \(2009\)](#) introduced the notion of isotropic order and developed a methodology for estimating parameters under this constraint. Given the recent interest among cell biologists in identifying cell cycle genes that are conserved among multiple species, [Fernandez et al. \(2011\)](#) developed a methodology for dealing with isotropic testing problems. The *R* package *isocir* provides a user friendly software for running all these methods in any context where circular data may appear.

References

- Fernandez, M., C. Rueda, and S. Peddada (2011). Isotropic order among core set of orthologs conserved between budding and fission yeast. *Preprint*.
- Rueda, C., M. Fernandez, and S. Peddada (2009). Estimation of parameters subject to order restrictions on a circle with application to estimation of phase angles of cell-cycle genes. *Journal of the American Statistical Association* 104(485), 338–347.