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# Applying circular statistics can cause artefacts in the calculation of vector coding variability: A bivariate solution

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## Highlights

- Vector coding variability can be artificially inflated by a data processing artefact
- The artefact is caused by the application of circular statistics in the analysis
- The artefact is greater when points on the angle-angle plot are closer together
- Running data may be contaminated by the artefact
- An approach based on the calculation of an ellipse area overcomes the problem

## Abstract

**Background:** Coordination variability is thought to provide meaningful insights into motor learning, skill level and injury prevention. Current analytical techniques, based on vector coding (VC) methods, use calculations from circular statistics. However a statistical artefact associated with the application of circular statistics may artificially increase the estimated coordination variability, especially when VC vectors are short.