

# 2.1 General description

## Key reference

- **Method:** [Anderson \(2006\)](#)

PERMDISP is a routine for testing the homogeneity of multivariate dispersions on the basis of any resemblance measure. The test is a dissimilarity-based multivariate extension of Levene's test ( [Levene \(1960\)](#) ), following the ideas of [van Valen \(1978\)](#) , [O'Brien \(1992\)](#) and [Manly \(1994\)](#) , who used Euclidean distances. In essence, the test uses the ANOVA  $F$  statistic to compare (among different groups) the distances from observations to their group centroid. The user has the choice of whether to perform the test on the basis of distances to centroids or distances to spatial medians ( [Gower \(1974\)](#) ). The user also has the choice either to use traditional tables or to use permutation of appropriate residuals (either least-squares residuals if centroids are used or least-absolute-deviation residuals if spatial medians are used) in order to obtain  $P$ -values.

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