Optimal Rank-Based Tests
for Homogeneity of Scatter

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We propose a class of locally and asymptotically optimal tests, based on multivariate ranks and signs, for the homogeneity of scatter matrices in m elliptical populations. Contrary to the existing parametric procedures, these tests remain valid without any moment assumptions, and thus are perfectly robust against heavy-tailed distributions (*validity robustness*). Nevertheless, they reach semiparametric efficiency bounds at correctly specified densities (*efficiency robustness*). In most cases, their normal-score version outperforms Schott's pseudo-Gaussian test (*JSPI* **94**, 25-36, 2001), which, as we also show, actually is a robustified version of the traditional Gaussian likelihood ratio test.

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