## A LEPAGE-TYPE TEST FOR GENERALISED SECANT HYPERBOLIC DISTRIBUTION

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We introduce a new location-scale rank test efficient for the generalised secant hyperbolic distribution. This distribution family consists of symmetric unimodal distributions of various tails, and is interesting in applications where the lack of normality is explained by the tail behaviour of data distributions. Such applications may be found, for example, in econometrics and signal and image analysis. The new test is a family of Lepage-type tests, each of which combines the standardised location and scale rank statistics efficient under their alternative hypotheses for a specific distribution. We study the small-sample and asymptotic properties under the null hypothesis of randomness, and conclude that the test is fairly robust to distributional misspecification, as long as the order of tail is not very wrong, that is a heavy-tailed distribution is not specified for a light-tailed one. However, the test is very sensitive to the presence of outliers. To overcome this lack of robustness in practice, we suggest applying the location-scale test built on the first two components of the Cramer-von Mises statistic to heavy-tailed distributions, and modifying the scale component in a certain way for normal-like and light-tailed distributions. For normal-like distributions, we present a modification method that solves the robustness problem but leads to a slight decrease in the efficiency of the corresponding scale test.