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SAS distributions

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Sinh-arcsinh (SAS) distributions were first proposed in [1] and arise from the application of the SAS transform to a continuous random variable that is symmetrically distributed about the origin. In addition to location and scale parameters, SAS distributions have two extra parameters controlling skewness and kurtosis. Consequently, the forms they can adopt are extremely wide-ranging. The special cases of the sinh-arcsinhed normal (SASN), t (SAST) and logistic (SASL) classes have been studied in [1], [5] and [4], respectively, and employed to model stochastic scenarios as diverse as crude oil production (cf. [2]), central limit theorems under special relativity (cf. [3]) and gamma-ray burst duration (cf. [6]). SASN densities are always unimodal, whereas SAST and SASL densities can be uni- or bimodal. I will summarize the basic properties of SAS distributions, many of which are highly appealing and some of which are perhaps surprising, and present new results for quantile-based estimation of their parameters and the performance of edf-based parametric bootstrap goodness-of-fit tests.

References

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