# Tests of Fit for the Inverse Gaussian Distribution

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This paper provides some new goodness of fit tests which can be used for assessing the appropriateness of both discrete and continuous distributions. The main focus is on the inverse Gaussian distribution most applications of which are justified by the fact that it is the distribution of the first passage time in Brownian motion with positive drift. In reliability analysis and life testing it is preferable to the gamma and Weibull distributions in systems experiencing fatigue for a period of a large number of charges and then showing a decreasing failure due to their hardening.

The first test statistic uses a standardized version of the logarithm of the empirical moment generating function in order to construct plots which are equivalent to a goodness-of-fit test whose critical points are obtained from fitted equations involving the sample size and the estimated shape of the inverse Gaussian distribution.

The second test is based on measures of divergence whose asymptotic distribution is a chi-square distribution with appropriate degrees of freedom. An extensive simulation study shows that the new tests maintain good stability in level and high power across a wider range of distributions and sample sizes than other tests.