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IMPROVEMENTS OF GOODNESS-OF-FIT STATISTICS FOR SPARSE MULTINOMIALS BASED ON NORMALIZING TRANSFORMATIONS

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Abstract. We consider multinomial goodness-of-fit tests for a specified simple hypothesis under the assumption of sparseness. It is shown that the asymptotic normality of the Pearson X^2 statistic (X_k^2) and the log-likelihood ratio statistic (G_k^2) assuming sparseness. In this paper, we improve the asymptotic normality of X_k^2 and G_k^2 statistics based on two kinds of normalizing transformation. The performance of the transformed statistics is numerically investigated.

Key words and phrases: Normalizing transformation, Pearson X^2 statistic, log-likelihood ratio statistic, sparse multinomials.