

Asymptotic Properties and Numerical Comparison Spacings-based Power Divergence Statistics

¹Boček Pavel , ²Vajda Igor , ³van der Meulen Edward

The asymptotic results of [3] are specialized to the case of power divergence statistics, which are generated by the so-called power functions ϕ_α defined for all powers $\alpha \in \mathcal{R}$. Closed form expressions are obtained for the asymptotic parameters of these power divergence statistics for $\alpha \in (-1, \infty)$, and their continuity in α on the subinterval $(-1/2, \infty)$ is proved. These closed form expressions are used to compare local asymptotic powers of tests based on these statistics. Tables of values of the asymptotic parameters are presented for selected representative orders of $\alpha > -1/2$. A program package PODISTAT was developed for the evaluation of several power divergence spacings statistics. These programs are applied to compare three families of spacings-based power divergence statistics for a specific hypothetical distribution and two examples of data sets.

References

- [1] I. Vajda and E.C. van der Meulen. *Divergences Between Models and Data under Hypothetical and Empirical Quantiles*. Res. Report No. 2275, Institute of Information Theory and Automation, Prague (available online at <http://simu0292.utia.cas.cz/vajda/RR2274>), 2010.
- [2] I. Vajda and E.C. van der Meulen. *Goodness-of-fit Criteria based on Observations Quantized by Hypothetical and Empirical Percentiles*. Chapter 23 of *Handbook of Fitting Statistical Distributions with R* (eds. Z.Karian and E.J.Dudewicz), CRC Press, to appear October 2010.
- [3] I. Vajda and E.C. van der Meulen. Limit theorems and asymptotic equivalence for a class of spacings-based ϕ -disparity statistics. Abstract, *Prague Stochastics 2010* .

¹ÚTIA AVČR, Czech Republic, bocek@utia.cas.cz

²ÚTIA AVČR, Czech Republic,

³Katholieke Universiteit Leuven, Belgium, edward.vandermeulen@wis.kuleuven.be