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Asymptotic results on a general class of empirical statistics: power and confidence interval properties

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Abstract We consider a very general class of empirical statistics that includes (a) empirical discrepancy (ED) statistics, (b) generalized empirical exponential family likelihood statistics, (c) generalized empirical likelihood statistics, (d) empirical statistics arising from Bayesian considerations, and (e) Bartlett-type adjusted versions of ED statistics. With reference to this general class, we investigate higher order asymptotics on power and expected lengths of confidence intervals. For (b)-(e), such results have been hitherto unexplored. Furthermore, our findings help in understanding the presently known results on the subclass (a) from a wider perspective.

Keywords Average power · Bartlett-type adjustment · Confidence interval · Contiguous alternatives · Edgeworth expansion · Empirical likelihood · Minimality · Second-order · Third-order