A NOTE ON LIKELIHOOD ASYMPTOTICS IN NORMAL LINEAR REGRESSION

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Abstract. Higher-order likelihood methods often give very accurate results. A way to evaluate accuracy is the comparison of the solutions with the exact ones of the classical theory, when these exist. To this end, we consider inference for a scalar regression parameter in the normal regression setting. In particular, we compare confidence intervals computed from the likelihood and its higher-order modifications with the ones based on the Student t distribution. It is shown that higher-order likelihood methods give accurate approximations to exact results.

Key words and phrases: Adjusted profile likelihoods, confidence interval, higher-order asymptotics, modified directed likelihood, nuisance parameter, orthogonal parameterization.