THE 3/2TH AND 2ND ORDER ASYMPTOTIC EFFICIENCY OF MAXIMUM PROBABILITY ESTIMATORS IN NON-REGULAR CASES

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Abstract. In this paper we consider the estimation problem on independent and identically distributed observations from a location parameter family generated by a density which is positive and symmetric on a finite interval, with a jump and a nonnegative right differential coefficient at the left endpoint. It is shown that the maximum probability estimator (MPE) is 3/2th order two-sided asymptotically efficient at a point in the sense that it has the most concentration probability around the true parameter at the point in the class of 3/2th order asymptotically median unbiased (AMU) estimators only when the right differential coefficient vanishes at the left endpoint. The second order upper bound for the concentration probability of second order AMU estimators is also given. Further, it is shown that the MPE is second order two-sided asymptotically efficient at a point in the above case only.

Key words and phrases: Higher order two-sided asymptotic efficiency, maximum probability estimator, non-regular distributions, asymptotically median unbiased estimator, asymptotic concentration probability.