CRAMÉR TYPE LARGE DEVIATIONS FOR TRIMMED $L$-STATISTICS

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Abstract: In this paper, we propose a new approach to the investigation of asymptotic properties of trimmed $L$-statistics and we apply it to the Cramér type large deviation problem. Our results can be compared with those in Callaert et al. (1982)—the first and, as far as we know, the single article where some results on probabilities of large deviations for the trimmed $L$-statistics were obtained, but under some strict and unnatural conditions. Our approach is to approximate the trimmed $L$-statistic by a non-trimmed $L$-statistic (with smooth weight function) based on Winsorized random variables. Using this method, we establish the Cramér type large deviation results for the trimmed $L$-statistics under quite mild and natural conditions.

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