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## TESTS FOR PROFILE ANALYSIS BASED ON TWO-STEP MONOTONE MISSING DATA

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### Abstract

In this paper, we consider profile analysis for the observations with two-step monotone missing data. There exist three interesting hypotheses – the parallelism hypothesis, level hypothesis, and flatness hypothesis – when comparing the profiles of some groups. The  $T^2$ -type statistics and their asymptotic null distributions for the three hypotheses are given for two-sample profile analysis. We propose the approximate upper percentiles of these test statistics. When the data do not have missing observations, the test statistics perform lower than the usual test statistics, for example, as in [8]. Further, we consider a parallel profile model for several groups when the data have two-step monotone missing observations. Under the assumption of non-missing data, the likelihood ratio test procedure is derived by [16]. We derive the test statistic based on the likelihood ratio. Finally, in order to investigate the accuracy for the null distributions of the proposed statistics, we perform a Monte Carlo simulation for some selected parameters values.

**Keywords:** Hotelling's  $T^2$ -type statistic, likelihood ratio, profile analysis, two-step monotone missing data.

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