

# DETECTION OF MULTIVARIATE OUTLIERS WITH LOCATION SLIPPAGE OR SCALE INFLATION IN LEFT ORTHOGONALLY INVARIANT OR ELLIPTICALLY CONTOURED DISTRIBUTIONS

TAKAHIKO HARA

*Department of Mathematics, Kyushu University 33, Fukuoka 812, Japan*

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**Abstract.** This paper is concerned with two kinds of multiple outlier problems in multivariate regression. One is a multiple location-slippage problem and the other is a multiple scale-inflation problem. A multi-decision rule is proposed. Its optimality is shown for the first problem in a class of left orthogonally invariant distributions and is also shown for the second problem in a class of elliptically contoured distributions. Thus the decision rule is robust against departures from normality. Further the null robustness of the decision statistic which the rule is based on is pointed out in each problem.

*Key words and phrases:* Left orthogonally invariant, elliptically contoured, null robust, maximal invariant, Wijsman's representation theorem, UBIS decision rule.