TESTS FOR THE LINEARITY OF FUNCTIONAL RELATION

AND THEIR APPLICATION TO CLINICAL CALIBRATION PROBLEMS

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SUMMARY

A modified likelihood ratio test and approximate "F-test" are proposed for testing the linearity of functional relation between two variables with measurement error. These tests are applicable where the estimates of error variances are available.

Statistical properties of the proposed testing procedures and a non-parametric test by Theil(1951) are investigated, and a graphic plot analogous to the residual plot in regression analysis is proposed as a diagnostic tool for checking the linearity. The proposed methods are illustrated by analysing a clinical data consisting of bio-chemical measurements by two types of measuring instruments.

KEYWORDS: Functional relation; Calibration;
Test for linearity