وزارة التعليم العالي والبحث العلمي
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تقييم وتحسين التقريب الخطي لبعض نماذج الانحدار اللاخطية المستخدمة في الكيمياء الحركية

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ABSTRACT

Local Linear approximation of nonlinear regression models is the common method to obtain the least squares estimators and construct the approximate linear confidence regions for their parameters since it is easy and familiar to the statisticians.

But the linear approximation is not always adequate. It depends on curvatures-severity of the function and parameters which affects the properties of the least squares estimators and the values of predicted responses. So the measurements of curvatures-severity are regarded the diagnostic tools of the state of a nonlinear regression model which benefit the statistician to decide if the linear approximation is possible or not and to propose a suitable treatment for accomplishing the adequacy of the linear approximation and obtaining estimators with good properties. It is known that the least squares estimators for the parameters of nonlinear regression model are often biased , abnormal and their variances are note the minimum .

In this thesis, we offer the assumptions of the linear approximation-adequacy and relative curvature-measures of Bates and Watts. We suggest instructions to accomplish the adequacy of linear approximation and a new simple method in the light of the instructions to do that for kinetic chemistry models.

More over we assess our proposed method by applying it to two common nonlinear regression models in kinetic chemistry .

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