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# NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA



# GB/Z 27429-2022

## Guide to evaluation of laboratory research data uncertainty

实验室科研数据不确定性评估指南

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## Foreword

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1.Structure and Drafting Rules of Standardization Documents" drafted. Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents. This document is proposed and managed by the National Certification and Accreditation Standardization Technical Committee (SAC/TC261). This document is drafted by: China National Accreditation Center for Conformity Assessment, University of Science and Technology Beijing, Beihang University,

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Scientific research data is widely used to characterize the laws of the objective world and production and life. Due to the uncertainty of the research object itself, human cognition The scientific research data is uncertain due to the limitations of the measurement technology, the limitations of the means and so on. Therefore, only those who understand scientific data Uncertainty characteristics and degrees can be used to make more accurate use of these data. In the field of conformity assessment measurement, the measurement results are required to include information characterizing the dispersion of the results, i.e. measurement uncertainty, which has become a consensus in the field. At present, the basic document for uncertainty assessment published by the state is GB/T 27418-2017 "Measurement uncertainty assessment and Representation" and GB/T 27419-2018 "Measurement Uncertainty Evaluation and Representation Supplementary Document

1.Distribution Transfer Based on Monte Carlo Method" "Broadcasting", expounds the measurement uncertainty and its evaluation principles in principle. Commonly used methods include bottom-up, top-down, and The Carlo method. Compared with conformity assessment measurement, scientific research involves a wider range of objects, methods, conditions, etc., and the degree of standardization is low. Therefore, scientific research data has more complex sources of uncertainty, and it is difficult to solve various types of problems by applying existing methods in practical work. Uncertainty assessment of scientific research data. On the basis of classifying the characteristics of scientific research data, this document analyzes traceability data, massive data, multi-dimensional data, and repeatable test data. Applicable methods for uncertainty assessment of data, small sample data, unknown distribution data, and qualitative data are described, including method selection, assessment Process and application examples. The evaluation of uncertainty is more complicated, and it is difficult to do an accurate evaluation. Measurement, observation and simulation are the main technical means of scientific research, standardization and Quantification is an important way to ensure the quality of scientific research data. Guidelines for Assessing Uncertainty in Laboratory Research Data

## 1 Scope

GB/Z 27429-2022 is the Chinese national standard on guide to evaluation of laboratory research data uncertainty, in the field of services and company organization. The /Z suffix marks it as a guiding technical document: it does not prescribe requirements that can be certified against, but sets out the technique, the method or the state of the art that the

standards bodies recommend following. It was issued on 12 October 2022 by the State Administration for Market Regulation; Standardization Administration of China. As a guiding technical document it carries no separate date of entry into force: it applies from publication. Classification: ICS 03.120.30, CCS A40. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document describes the applicable methods for the uncertainty assessment of scientific research data, and provides suggestions and application examples for method selection and assessment procedures. This document applies to the assessment of uncertainty in data obtained directly or indirectly from research activities.

## 2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, dated citations documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to this document.

JJF1001-2011 General Metrology Terms and Definitions

## 3 Terms and Definitions

The terms and definitions defined in JFF1001-2011 and the following terms and definitions apply to this document.

3.1 measurand to be measured The quantity to be measured. [Source: JJF1001-2011, 4.7]

3.2 measurement principle A phenomenon used as a basis for measurement. [Source: JJF1001-2011, 4.4]

3.3 measurementmethod A general description of the logical arrangement given to the operations used in the measurement process. [Source: JJF1001-2011, 4.5]

3.4 Standard material referencematerial; RM standard sample reference material Substances of sufficiently homogeneous and stable specified properties whose properties have been demonstrated to be suitable for their intended use in measurement or in the examination of nominal properties. [Source: JJF1001-2011, 8.14]

3.5 calibration A set of operations under specified conditions, the first step of which is to determine the relationship between the magnitude provided by the measuring standard and the corresponding indication, the second step It is to use this information to determine the relationship between the measurement results obtained from the indication value, where both the quantity provided by the measurement standard and the corresponding indication

value have measurement uncertainty. fixed.