

News from the JCGM-WG1

MEETINGS The JCGM-WG1 meets twice per year, normally at the BIPM. Since the beginning of the COVID-19 pandemic, the meetings are held remotely. During the meetings, the drafts of the documents under development are reviewed and discussed in detail. The most recent meeting was held on 25-28 May 2021 and the next regular meeting is planned for December 2021 with two special meetings on new measures of uncertainty and on definitions of terms related to measurement uncertainty, respectively, in September 2021.

MEMBERSHIP New members since 2019:
Hideyuki Tanaka from NMIJ, Japan (OIML)
Eric Shirley from NIST, USA, (IUPAP)
Olha Bodnar from Örebro University School of Business, SE, (IUPAC)

Complete membership [here](#)

GUIDE TO THE EXPRESSION OF UNCERTAINTY IN MEASUREMENT - NEW PERSPECTIVE

Under the New Perspective, “the GUM” is the whole suite of documents published by the JCGM-WG1, thus broadening the scope of the first edition of that fundamental document. A first document, GUM Part 6, has been published (see below). Existing documents, suitably updated, will be renumbered and re-published as parts of the suite and new parts will be added to meet the evolving needs in the field of uncertainty evaluation. To cite just an example, there is a growing awareness that the result of the examination of nominal properties is not complete without a statement concerning the uncertainty associated with the examination.

DOCUMENTS IN PREPARATION

JCGM GUM-1:202x Guide to the expression of uncertainty in measurement – Part 1: Introduction

In the new perspective, GUM-1 is the overarching document in the suite of documents under the common title “Guide to the expression of uncertainty in measurement” (GUM), providing a brief introduction to the suite. Its aim is to promote appropriate methods

for the evaluation of measurement uncertainty by using the GUM. This document will aid the reader in identifying the relevant documents for addressing the problem at hand. It will contain hyperlinks to documents in the suite. It also will provide references to other relevant material, including that from other organizations, for a broader understanding. This document will replace JCGM 104:2009.

JCGM GUM-5:202x Guide to the expression of uncertainty in measurement – Part 5: Examples of uncertainty evaluation

The idea of a separate examples document was confirmed and approved by the JCGM. This choice will allow greater flexibility whenever new examples will be made available. The examples will illustrate various methods of uncertainty evaluation, thus concerning the whole suite of documents published by JCGM-WG1. They will also cover various areas of measurement.

An EMPIR Joint Research Project, n-02 EMUE Advancing measurement uncertainty – comprehensive examples for key international standards, was established in 2017 under the initiative of several European members of the JCGM-WG1. Its deliverables will provide valuable input to GUM Part 5.

JCGM GUM-9:202x Guide to the expression of uncertainty in measurement – Part 9: Statistical models and data analysis for interlaboratory studies

This document suggests general principles and describes illustrative examples of application, which will use data from actual KCs and other inter-laboratory studies.

This document is intended for use by pilot laboratories in KCs, by members of [CIPM Consultative Committees](#) generally, and by scientists, engineers, medical doctors, and laboratory technicians, engaged in inter-laboratory studies, either carrying them out, and reducing the corresponding data, and in interpreting and using the results of such studies and tests.

The following documents (working titles) will be developed at a later stage:

- *JCGM GUM-2 Basic principles and methods*
- *JCGM GUM-10 Applications of the least-squares method*
- *JCGM GUM-11 Bayesian methods*
- *JCGM GUM-12 Basic methods for uncertainty evaluation*

OTHER BUSINESS

- **Workshop.** A workshop on Type A uncertainty evaluation was held at the BIPM in December 2019, with special attention to the case of a small sample of indications. Many WG1 members and some invited guests lectured on the topic, and the outcome of the workshop will be considered for a future Part of the GUM.
- Several extra meetings are devoted to the specific topic of definitions of terms related to measurement uncertainty, to be offered to JCGM-WG2.

PUBLICATIONS

Existing publications are listed below with their current titles. All the documents published prior to the new perspective will be revised and updated in view of their publication as parts of the GUM suite.

JCGM 100:2008. Guide to the expression of uncertainty in measurement, GUM 1995, with minor modifications

Current version of the GUM.

Freely available in electronic (PDF) form from the websites of the [BIPM](#) and [OIML](#), and published in paper and PDF forms by [ISO](#) under the name “ISO/IEC Guide 98-3:2008”.

JCGM 101:2008. Evaluation of measurement data — Supplement 1 to the “Guide to the expression of uncertainty in measurement” — Propagation of distributions using a Monte Carlo method

General method for uncertainty evaluation, of particular interest for measurement models with a high level of complexity, or to evaluate a coverage interval for a non-linear model or in case of non-normal input quantities. In these cases the method, being more general than that described in JCGM 100, gives more reliable evaluations.

Freely available in electronic (PDF) form from the websites of the [BIPM](#) and [OIML](#), and published in paper and PDF forms by [ISO](#) under the name “ISO/IEC Guide 98-3:2008/Suppl 1:2008”.

JCGM 102:2011. Evaluation of measurement data — Supplement 2 to the “Guide to the expression of uncertainty in measurement” — Extension to any number of output quantities

Generalization of JCGM 100 and JCGM 101 to the case of multivariate output quantities.

Freely available in electronic (PDF) form from the website of the [BIPM](#) and [OIML](#), and published in paper and PDF forms by [ISO](#) under the name “ISO/IEC Guide 98-3:2008/Suppl 2:2011”.

JCGM 104:2009. Evaluation of measurement data — An introduction to the “Guide to the expression of uncertainty in measurement” and related documents

Introductory document extensively hyperlinked to the other JCGM documents.

Freely available in electronic (PDF) form from the websites of the [BIPM](#) and [OIML](#), and published in paper and PDF forms by [ISO](#) under the name “ISO/IEC Guide 98-1:2009”.

JCGM 106:2012. Evaluation of measurement data — The role of measurement uncertainty in conformity assessment

Guidance document to calculate acceptance limits necessary to assess the conformity of an item to a specification.

Freely available in electronic (PDF) form from the websites of the [BIPM](#) and [OIML](#), and published in paper and PDF forms by [ISO](#) under the name “ISO/IEC Guide 98-4:2012”.

JCGM GUM-6:2020. Guide to the expression of uncertainty in measurement— Part 6: Developing and using measurement models

This is the first document published as a part of the GUM under the new perspective. It provides guidance on developing and using a measurement model and covers the assessment of the adequacy of a measurement model. The document is of particular interest to developers of measurement procedures, working instructions and documentary standards.

Freely available in electronic (PDF) form from the websites of the [BIPM](#) and [OIML](#) and published in paper and PDF forms by [ISO](#) under the name “ISO/IEC Guide 98-6:2021”