

News from the JCGM-WG1

MEETINGS The JCGM-WG1 normally meets twice per year at the BIPM. During the meetings, the drafts of the documents under development are reviewed and discussed in detail. The most recent meeting was held on 9 – 12 May 2017 and the next meeting is planned for the end of November 2017.

MEMBERSHIP Wolfgang Woeger (PTB and IUPAP) and Brynn Hibbert (IUPAC) resigned during 2016.

New members are Michael Krystek (PTB) as ISO representative, and Juris Meija (NRC) and Steven Ellison (LGC) as IUPAC representatives.

DOCUMENTS IN PREPARATION

JCGM 100. Guide to uncertainty in measurement - new perspective

After the largely negative reception of the first Committee Draft of the revised GUM, circulated at the end of the year 2014, the working group responded analytically to all the comments received from the Member Organizations and the National Metrology Institutes. The working group also considered how to cope with the new scenario and elaborated a strategy for the future, with a timeline defined in a roadmap. A change of perspective was deemed to be necessary, where “the GUM” would become the whole suite of documents published by JCGM-WG1 and the technical novelties introduced in the rejected Committee Draft would be included in a document co-existing with JCGM 100:2008.

JCGM 110. Examples of uncertainty evaluation

This document was received more favourably than his companion. In particular, the idea of a separate examples document was confirmed. Its examples will illustrate various methods of uncertainty evaluation, thus concerning the whole suite of documents published by JCGM-WG1. More examples should be developed and input from the CIPM Consultative Committees is welcome.

JCGM 103. Developing and using measurement models

In the new organization of the JCGM-WG1 documents, all of them will stand on the same footing, so that the distinction between main document and supplement will be dropped. As a consequence, this document, as well as the others, will be renamed. However, its scope and content are unchanged. This document provides guidance on defining the measurand, and on developing and using a measurement model. The various stages of modelling, from that of the measurement principle to that of systematic effects are discussed, and different types of models from different fields, including statistical models, are considered. This document should answer part of the criticisms received on the first CD of the revised GUM. It is anticipated that the first Committee Draft would be circulated by the end of 2017.

Guide to the expression of uncertainty in measurement – Introduction

In the new perspective, this is the overarching document in the suite of documents under the common (working) title “Guide to the expression of uncertainty in measurement” (GUM). It will be largely based on the existing JCGM 104:2009, providing a brief introduction to measurement uncertainty and the GUM. 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 the suite of documents. It also will provide references to other relevant material, including that from other organizations, for a broader understanding.

The following documents should be developed at a later stage:

- *JCGM 107. Applications of the least-squares method*
- *JCGM 108. Bayesian methods.*

OTHER BUSINESS

- ***Metrologia* focus issue on the BIPM Workshop on measurement uncertainty.** The new Focus Issue programme for *Metrologia* has replaced the Special Issue programme. The [issue](#) on the “[BIPM Workshop on Measurement Uncertainty](#)” is now virtually concluded. It comprises fifteen papers based on presentations given at the workshop.
- **IUPAC/CIAAW.** The IUPAC project on the uncertainty evaluation of atomic weights is essentially concluded. The *Guidelines for the use of atomic weights* are, on request of IUPAC, being transformed into a Technical Report. The Technical Report on *Interpreting and propagating the uncertainty of the standard atomic weights*, authored by JCGM-WG1 and IUPAC members, is now published.

PUBLICATIONS

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

Current version of the GUM. A revision of this document is in progress (see above).

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-gaussian input quantities. In these cases the method, being more general than that described in the GUM, 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 the GUM and of its Supplement 1 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”.