

Background to the JCGM webinar on the definition of Measurement Uncertainty

The JCGM

The Joint Committee for the Guides on Metrology (JCGM) has two working groups:

- [WG1 which works on the Guide to the Expression of Uncertainty in Measurement \(JCGM 100:2008\)](#)
- [WG2 which works on the International Vocabulary of Metrology \(VIM\)](#)

Development of a draft fourth edition of the VIM

The most recent version of the VIM is the third edition (“VIM3”) which was first published in 2008 and subsequently re-published with minor corrections in 2012.

Following the publication of VIM3, WG2 started to work on a fourth edition of the VIM (“VIM4”). The initial motivation for this work was to address certain definitions included in the third edition that had been the subject of many comments during the consultation, and to incorporate definitions used for the metrology of nominal properties. (This latter action was explicitly requested by the CIPM).

WG2 completed a committee draft for the VIM4 in 2021. It was circulated to the eight JCGM Member Organizations for comment in 2021 and over 1500 comments were received. In response to these comments, WG2 circulated a second committee draft in 2023. This later circulation also generated more than 1500 comments. Following receipt of these comments, WG2 has started to prepare a third committee draft of the VIM4.

A new definition for Measurement Uncertainty

There are several concepts defined in the VIM that are central to the work of WG1. These include ‘measurement uncertainty’ and some concepts directly related to it.

In 2021, WG1 started a discussion on the definition of ‘measurement uncertainty’ and developed an internal consensus on a definition that differs significantly from that included in the current edition of the JCGM 100:2008 and the VIM3 - the definitions are given below.

Recognizing the importance of developing a harmonized definition of such an important concept, the two working groups convened a joint task group to seek a consensus on the definition. The two working groups have now reached a consensus position on a definition of ‘measurement uncertainty’ (see below).

Online webinar

This proposed definition of ‘measurement uncertainty’ has been agreed by WG1 and WG2 but it was not included in the circulation of the two committee drafts of the VIM4. As such, it has not been open to the level of review from the JCGM Member Organizations as the rest of the text of the committee drafts of VIM4. For this reason, an online webinar will be held to explain the motivation for the proposed new definition and to allow some discussion about its acceptability for inclusion in the VIM4.

The outcomes of the discussion at the webinar will influence the decision by WG2 as to whether the new definition is included in a third committee draft of the VIM4 which is expected to be circulated in the third or fourth quarter of 2025.

For reference

The definition of ‘measurement uncertainty’ published in the VIM3 is:

measurement uncertainty – “non-negative parameter characterizing the dispersion of the quantity values being attributed to a measurand, based on the information used” (2.26)

The definition and notes for measurement uncertainty proposed by WG1 and WG2 are:

measurement uncertainty – “doubt about the value of the measurand that remains after making a measurement”.

NOTE 1 For the purpose of this definition, the term 'true value of the measurand' is not used because the word 'true' is viewed as redundant.

NOTE 2 Measurement uncertainty can be described fully and quantitatively by a probability distribution on the set of possible values of the measurand.

NOTE 3 For scalar measurands, measurement uncertainty can be summarized by, for example, the standard uncertainty, a coverage interval with specified coverage probability, or by selected quantiles of the probability distribution in Note 2. For multivariate measurands, measurement uncertainty can be described, for example, by the covariance matrix or by a coverage region, with specified coverage probability.