



Draft Resolution D

On the definition of an international lunar reference time scale and its traceability to UTC

**28th meeting of the
General Conference on
Weights and Measures
(2026)**



The documents presented to the General Conference on Weights and Measures (CGPM) are prepared in English as well as French.

Please note, however, that the official version, particularly of the Resolutions voted by the CGPM, is the French one.

Version history

Version 1	2026/01/13	Publication of Draft Resolutions
Version 2	2026/01/30	Draft Resolution C: effective date of continuous UTC set on 20 May 2027
Version 3	2026/03/30	Draft Resolution D: need to use conventional values fixed by international organizations and to consider the role of the BIPM
Version 4	2026/06/30	Draft Resolution D: “the realization of lunar reference time scales” replaced by “the realizations of the lunar reference time scale” in the “further recommends” section, to reflect the aim of the draft resolution to state that there must be a unique lunar reference time scale, even if there may be several realizations
Version 5	2026/07/13	Draft Resolution V: amounts for the proposed dotation added

To contact the Director of the BIPM:

Dr Annette Koo
Pavillon de Breteuil
F-92312 Sèvres Cedex, France
annette.koo@bipm.org
+33 (0) 1 45 07 70 00
<https://www.bipm.org>

Text approved by the CIPM in January, March and June 2026
Published by the BIPM

On the definition of an international lunar reference time scale and its traceability to UTC

The General Conference on Weights and Measures (CGPM), at its 28th meeting,

considering that

- there is growing interest amongst space agencies in the development of lunar infrastructure, including Positioning, Navigation, and Timing (PNT) systems,
- such systems and their interoperability require reference frames and reference time to be recognized and adopted internationally,
- the International Astronomical Union (IAU) at its XXXIInd general assembly in 2024 defined the Lunar Celestial Reference System (LCRS), with its Lunar Coordinate Time (TCL), together with the equations that allow the coherent relativistic transformation from the Solar System Barycentric Coordinate Time (TCB) to TCL,
- the IAU, the International Association of Geodesy (IAG), and the International Committee on GNSS (ICG) have engaged with the International Bureau of Weights and Measures (BIPM) to collaborate on the definition of an international lunar reference time scale and its traceability to Coordinated Universal Time (UTC),

recalling that

- the CGPM at its 26th meeting (2018) adopted Resolution 2 “On the definition of time scales”, which states that “UTC is the only recommended time scale for international reference and the basis of civil time in most countries”,
- the *Mise en pratique* for the definition of the second in the SI published as an appendix of the SI Brochure states that “the definition of the second should be understood as the definition of the unit of proper time”,

noting that

- high-accuracy lunar applications would be greatly complicated by the direct use of UTC due to the significant effects of general relativity,
- a proliferation of reference time scales risks ambiguity when exchanging time-tagged data and must be avoided,

further noting that

- a coordinate lunar reference time scale, accounting for general relativity, could be either TCL or a scaled version of it, corresponding to TCL plus a conventional frequency offset,

- a scaled version of TCL would require the definition of an additional set of astronomical parameters that would not be compatible with the use of TCB and TCL systems,
- thorough studies have shown that TCL without any scaling would meet the scientific requirements for a lunar reference time scale,
- operational constraints in lunar projects, relating to the particular architectures decided upon by space agencies, may impose additional requirements on the definition and realization of a lunar reference time scale,

welcoming the support from space agencies and space communities working on lunar projects and their contributions to discussions about a possible lunar reference time scale,

encourages space agencies operating pioneering lunar projects to share their practical experience with the scientific community and when a realization of the lunar time scale is measured with respect to UTC to obtain traceability, to describe in full the model used to determine the relativistic effects, the input ephemerides, and the associated uncertainties,

recommends that

- if a scaled version of TCL corresponding to the lunar geoid is considered, its frequency offset with respect to TCL is chosen according to a conventional fixed value of the gravitational potential, established by the relevant international organizations such as IAU and IAG, and its origin is in agreement with the TCL origin defined by IAU,

further recommends that

- the International Committee for Weights and Measures (CIPM) consistently considers the results of such pioneering projects and takes action, as necessary, concerning the definition of a lunar reference time scale and the BIPM's role in relation to lunar time coordination and comparison with UTC,
- the BIPM and the National Metrology Institutes (NMIs) work in collaboration with space agencies and international organizations to support the realizations of the lunar reference time scale, and their measurement with respect to UTC, with the involvement of the UTC community.

Pavillon de Breteuil
F-92312 Sèvres Cedex
FRANCE
bipm.org

© *bipm.org*, 2026.