Message from the BIPM and BIML Directors

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"The SI – fundamentally better"

The International System of Units (SI) is the accepted set of units for all applications of measurement worldwide. Although one of its aims is to provide the basis for measurements that are stable over long periods of time, it has always been a practical and dynamic system that has changed to exploit the latest scientific advances.

In November 2018, the General Conference on Weights and Measures met in Versailles and agreed one of the most significant sets of changes to the SI since its inception in 1960. These were to base it on our best understanding of the laws of nature and to eliminate the link between the SI and definitions based on physical artefacts. The changes build on the results of research into new measurement methods that use quantum phenomena as the basis for standards that are fundamental.

These changes were agreed in November 2018 and come into force on May 20th 2019, a date chosen because it is the anniversary of the signature of the Metre Convention, celebrated by World Metrology Day. Whilst the future impact of the changes will be far reaching, great attention has been paid to ensure that the new definitions will be compatible with the current ones at the time the change is implemented. The changes will not be noticeable to any but the most demanding users, but, they do mean that there may be changes in the way that traceability is ultimately established. The global work to harmonize the operation of instruments used to make measurements will continue to ensure that trade, industry and consumers will not notice any difference to the weights, lengths and other measures they use.

The new definitions use 'the rules of nature to create the rules of measurement', linking measurements at the atomic and quantum scales to those at the macroscopic level. They achieve a collective ambition for the "metric system" which has been to provide universality of access to the agreed basis for worldwide measurements. They will provide the basis for future innovations in measurements that will allow the definitions of the second, the metre, the ampere and the kelvin to take advantage of atomic and quantum phenomena to achieve levels of accuracy limited only by our capacity to observe them.