

## **RECOMMENDATION - DRAFT**

### **On absolute calibration of GNSS equipment for time transfer**

The Consultative Committee for Time and Frequency (CCTF)

**considering** that

- time and frequency transfer data reporting the reception of Global Navigation Satellite Systems (GNSS) signals at the contributing time laboratories “k” play an important role in the realization of UTC,
- the ability to measure accurately GNSS time scales against UTC(k) requires hardware delays of the time transfer equipment involved to be determined,
- GNSS constellations continuously improve their signals and increase the signal diversity,

**noting** that

- Recommendation CCTF 4 (2012) asked laboratories contributing to UTC to upgrade their GNSS equipment towards multi-frequency multi-constellation receiving systems providing code- and carrier-phase measurements and to supply data from at least three receivers,
- Recommendation CCTF 4 (2001) asked that absolute and differential calibration methods be continued to be developed and put into operation for all time transfer techniques used in TAI computation, with the aim of achieving 1 ns standard uncertainty,

**recommends** that

- Competent laboratories continue their efforts in determining signal delays in GNSS receiver installations, including antenna, antenna cable and receiver electronics, providing so-called “absolute calibrations” for existing and emerging GNSS signals,
- BIPM maintains a list and a follow-up of the absolutely calibrated GNSS stations and their comparisons with the receiver systems operated in G1 laboratories.