# A rapid computation of a prediction of TAI and UTC

Contribution by the BIPM

There is a strong incentive towards producing in near real-time a time scale, TAIp, that could be as close as possible to TAI, in effect providing a prediction of TAI (one may also regard this as a preliminary version of TAI). This time scale would be based on a subset of the TAI clocks, from a number of laboratories willing to provide their clock and link data also in near real-time on a regular basis. The corresponding prediction of UTC, UTCp, could be realized through the UTC(k) of participating laboratories.

Tests have been carried out to estimate the performance of such a UTCp vs. UTC by simulating its computation using several months of real data (BIPM time section Technical Memorandum 92). Results suggest that, if some major laboratories (contributing about half the good clocks of TAI) participate, |UTCp – UTC| could be below about 2 ns in most cases, with possible systematics reaching 10 ns 50 days after the last date for which the actual computation of TAI is available

It is proposed that the BIPM could initiate a Pilot Experiment to test the computation of such a prediction. First, the BIPM would set-up the necessary procedures to carry out the data taking, data checking and data processing in an automated way. Then, in a second stage, the computation of the predicted time scale would be carried out regularly. For example the following steps could be envisioned:

- A set of voluntary laboratories would install automatic procedures to send clock and links data every ten days, on each MJ date divisible by 10 (i.e. the day following a TAI standard date ending by 9). These dates are here noted MJDd.
- The BIPM would compute TAIp on the next working day following MJDd, with the aim of providing to the participating laboratories the values UTCp – UTC(k) for the two TAI standard dates MJDd-1 and MJDd-6 at the end of that working day.

The BIPM plans to have the automated procedures set-up by early 2002 so that the computation phase could start at that time. After about a year of operations, the outcome of the Pilot Experiment would be discussed, e.g. at the next CCTF and TAI meeting.