UTC Leap Second

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(Universal Time Coordinated) UTC is the time scale that is used worldwide to coordinate technical and scientific activities. It is a compromise between the highly stable atomic time and the irregular Earth rotation.

(Universal Time) UT1 is the time of the Earth clock, which performs one revolution in about 24h. It has short term instabilities at the level of 10^{-8} and the duration of the day is slowly decaying (almost 0.002 sec/century).

(Temps Atomique International) TAI is the atomic time scale and its unit interval is exactly one second at sea level. The origin of TAI is such that UT1-TAI was 0 on 1958-Jan-01. The instability of TAI is about 6 orders of magnitude smaller than that of UT1.

Because of the secular deceleration of the Earth's rotation, TAI, of which the unit of time, corresponds to the second of the mean solar day of the epoch 1820, presents a continuous increasing (parabolic) shift with respect to UT1. If legal time was based upon TAI, coincidence with solar day could not be maintained (in a couple of year TAI - UT1 can increase by a few seconds). Therefore international community, for reckoning time, used the intermediate time scale UTC.

UTC differs from TAI by an integer number of seconds, in such a way that UT1-UTC stays smaller than 0.9 sec in absolute value. Therefore a **leap** second in UTC is introduced, from time to time approximately every six years, to always meet this condition.

DUT = UT1-UTC

DUT = -0.663376 sec for 2005-Dec-30

DUT = +0.333992 sec for 2006-Jan-04