# A proposal to avoid a leap second

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1.None

The method is shown to avoid the leap second, which needs no special operation for almost persons.
1. Decrease of rotational angular velocity: The maximum rotational angular velocity of the earth at the origin of the earth, is expressed by the following formula, because the centrifugal force caused by the angular velocity ωo should be less than gravity.
(In the following, **: power)
 r xωo**2 = g
where Radius of the earth r = 6378100 m
 Standard gravitational acceleration g = 9.80665 m/s**2
Substituting these into the above,
 ωo = 1.2400x10**-3 rad/sec = 107 rad/day
At this value the force balances with the gravity.
The present earth has
 ωp = 7.292x10**-5 rad/sec
Where ωo decreases exponentially,
 log (ωp / ωo) = - k t (1)
Substituting followings into the above,
 ωo / ωp = 1.240x10**-3/7.292x10**-5
 = 16.98
 log (ωo / ωp ) = 2.833
and the earth's age
 t = 4.55 bil. years = 1.436x10**17 secs
We get
 k = 1.973x10**-17/sec = 6.226x10**-10/year
 = 0.623/bil.year
In past 15 years, the leap second has been substituted five times. Where the present period is T0 , the period T after three years is expressed as follows:
 T - T0 = 1 sec
 T - T0 = 2π(1/ω - 1/ωo)=2π (ωo - ω)/(ωxωo)
Substituting the following into the above,
 ω= ωoxe**(-kt)
We get
 2π / ω{1-e**(-kt)} = 1sec
i.e. ω/2π = 1-e**(-kt) = kt
Substituting ω= ωp = 7.292x10**-5 rad/sec = 2301 rad/year
and t = 3 years,
we get
 k p = 3.869x10**-6/year
Substituting the above into (1), the present half-period of the earth is calculated as follows:
 log 0.5 = 0.6931 = 3.869x10**-6xTp
 Tp = 0.6931/3.869x10**-6 = 1.791x10**5 years
 = 180 thousands years
This value contradicts with the earth's age of 4.55 bil. years, that is caused by the inappropriate

 

definition of the second.
 The present second is defined as the 9192631770 times of one period T0 of radiant wave from Cs, whose frequency is 9.192631770 GHz. The leap second becomes unnecessary for more than hundred years, where the one second is made longer than present one, as follows: where we make the present radiant frequency f = 9.192631770 GHz from Cs, (1+1sec/3 years = 1+ 1.0563 x10**-8) times, and 9.192631673 GHz, because three years are about eighth power of ten (3 years = 0.9467x10**8 sec). Then the leap second becomes unnecessary, where the last three digits of the effect numbers of ten are changed to 9192631673, then
 9192631770/9192631673 = 1+1.056x10**-8
and one second becomes longer 1.056x10**-8, namely present one second becomes loner about one second for three years.
2. Effects of the change of time unit
 The basic unit, speed of light, is unchanged, where the unit of meter is changed to become shorter by 0.76x10**-8 m, caused by the second longer by 1.056x10**-8 sec.

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