Data for the chart above was computed at intervals of 100 years (as of January 1st at the end of each Gregorian century).

Earth's rate of rotation is slowing down to due Tidal Deceleration, caused mainly by Moon. From the slope of the linear regression line on the chart, solar days are 1.75 milliseconds longer each century. For comparison, historical eclipse records imply a rate of about 1.7 milliseconds each century.

For each date plotted, compute the ephemeris length of solar days based on the 10000 calendar days centered on that date:

\[ \text{Day}_\text{No} = \text{Fixed}_\text{From}_\text{Gregorian} ( \text{Gregorian}_\text{Year} , \text{January} , 1 ) \]

\[ M1 = \text{Dynamical}_\text{From}_\text{Universal} ( \text{Day}_\text{No} - 5000 ) \quad M2 = \text{Dynamical}_\text{From}_\text{Universal} ( \text{Day}_\text{No} + 5000 ) \]

\[ \text{Atomic}_\text{Seconds}_\text{Per}_\text{Solar}_\text{Day} = ( M2 - M1 ) \times 86400 / 10000 = ( M2 - M1 ) \times 216 / 25 \]

Difference in length of Mean Solar Day relative to the year 1900:

\[ \text{Difference} \text{ in milliseconds} = 1000 \times ( \text{Atomic}_\text{Seconds}_\text{Per}_\text{Solar}_\text{Day} - 86400 ) = - 8640 \times ( 10000 + M1 - M2 ) \]

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From "Hebrew Calendar Studies" page at <http://individual.utoronto.ca/kalendis/>.