

L_{25}

Daniel Kelley

13 June 2012

A Free Oscillation of Earth During the Leap Second of 30 June 2012¹

$$W_n = \sum_{i=1}^{18} A_i \sin(\phi_n F_i \theta),$$

Where:

W_n = Time domain signal n

$\phi_1 = 1.000000000$: The constant Unity

$\phi_2 = 1.000000004$: Ratio of the rate of rotation of the Earth between 29 June 2012 and 30 June 2012 ²

$\theta = 0.8141mHz$: Fundamental frequency of the free oscillation of the Earth ³

F, A : Relative frequency and amplitude of the harmonic spectrum of the free oscillation of the Earth for the given spherical harmonic modes

Table 1: Earth Harmonic Spectrum

i	F	A	Mode
1	0.3682	1.1692	0S2
2	0.3898	1.1428	0S2
3	0.4643	0.1165	0T2
4	0.5027	0.1579	2S1
5	0.5676	1.0113	0S3
6	0.5820	1.0677	0S3
7	0.7213	0.0338	0T3
8	0.7886	0.7819	0S4
9	0.7982	0.5338	0S4
10	0.8270	0.1767	1S2
11	0.8414	0.1353	1S2
12	0.9447	0.0188	0T4
13	1.0000	1.0000	0S0
14	1.0264	0.4323	0S5
15	1.0360	0.3459	0S5
16	1.1441	0.1804	3S1
17	1.1610	0.6917	1S3
18	1.2234	0.0075	2S2

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¹D. Gambis. *Bulletin C No. 43*. Paris: IERS EOP PC, Observatoire de Paris (2012)

²D. Gambis. *Bulletin A Vol. XXV No. 023*. Paris: IERS EOP PC, Observatoire de Paris (2012)

³J. Park, et al. Earth's Free Oscillations Excited by the 26 December 2004 Sumatra-Andaman Earthquake. *Science Vol. 308 no. 5725* 1139-1144 (2005) DOI: 10.1126/science.1112305