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Lunar tide had caused Tunguska phenomenon?

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Introduction

Although already 100 years have passed after the Tunguska event, the scientific community is still far from clear understanding of what happened in the Kulik-caldera, Eastern Siberia, where a great explosion had occurred on 30 June, 1908 at $7^h\ 15^m \pm 5^m$ a.m. (corresponding to $0^h\ 14^m \pm 5^m$ UT). The blast felled trees over 2,150 km^2. Barometric and seismic disturbances from the explosion were recorded world-wide. It is generally accepted that the Tunguska event resulted from the explosion of an asteroid or a comet. However there is no common agreement that the bolide really existed. The main puzzle is the absence of space-body remnants in/on the ground.

New approaches to solution of problem

It is well-known that any geographic point on the Earth undergoes four tidal extremums daily: two inflows and two outflows arising because of gravitational action of the Moon and the Sun. Although the Moon is much smaller than the Sun, it has a greater gravitational attraction for the Earth because the Moon is much closer to the Earth. To the best of our knowledge, till now nobody has calculated gravitational tides for June 30, 1908 – the day of the explosion in Siberia. For the Moon there is the elliptic semidiurnal tide N2 (with a period 12.66 h), unique, which depends on the distance Moon-Earth, actually reflecting a movement of the Moon from a perigee to apogee [1]. We used the software ([2], [3]) for numerical modelling of temporal variations for the lunar tide N2 for 30 June, 1908. Calculations showed that in the Kulik-caldera the lunar tidal outflow occurred at the local time $7^h\ 10^m$ ($\pm 6^m$) a.m. (Fig.1). This time precisely coincides with the registered time of the explosion in Siberia on June, 30th 1908 at $7^h\ 15^m$ a.m. ($\pm 5^m$). The Earth tidal bulge has a lag angle with reference to the lunar direction. The phase lag is caused by the Earth viscosity. Without friction in the solid Earth and during an inflowing tide the Earth strain would cause an upward motion of the ground along a line joining the centres of the Earth and the Moon, i.e., in this case a tidal bulge in the Earth have not a phase delay. Because the Tunguska event was observed in the flat area of the marshland in Siberia within one day nearby syzygy, it is possible to neglect a tidal phase delay with the highest level probability. During an outflowing tide the Earth stress would cause an inward motion of the ground. A compression is maximum with the Moon on the horizon (morning earthquakes). This effect could work on 30 June, 1908 at 7:15.

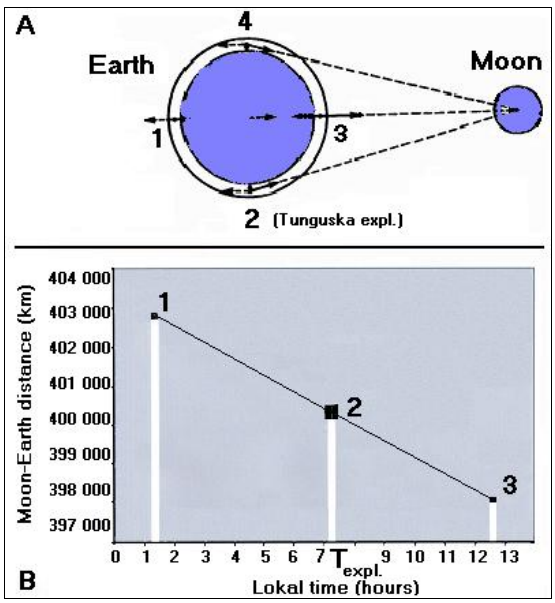

Figure 1: Temporal variations of the Earth-Moon distance over June 30, 1908
Top: Each geographical area on the Earth is a subject to four tidal extremums in day (in points 1. and 3. - inflows, in points 2. and 4. - outflows)
Bottom: The tidal outflow has passed through the Kulik-caldera at $7^h\ 10^m$ ($\pm 6^m$) a.m. (corresponds to the point 2.)

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Eastern Siberia is the field of protokimberlite pipes. The epicentre of the Tunguska explosion is the 248 Myr-old volcanic crater that associates with the mantle plume. Anomalous tide during the Tunguska phenomenon could lead to changes in a terrestrial magnetic dipole, a drift for magnetic effects in the core-mantle boundary D', and thus to trigger the tectonic activity.

Tunguska event and effects of solar eclipse

What could be the origin of the anomalous tide in June, 1908? During the Tunguska event prof. L. Weber informed about registrations of regular ULF magnetic oscillations in Kiel on 27-30 June, 1908 [4]. It is important that pulsations in Kiel were registered only in night time and have come to the end at 0:30 UT on June 30, 1908, i.e., about the time of the explosion in Siberia. Let us remind that a solar eclipse was observed on 28 June, 1908 from 13:30 till 19:30 UT. Phenomena which have been repeatedly observed during solar eclipses have led to speculation about: (a) a change of the gravitation constant G because a gravitation shielding (as a Allais-effect [5]), (b) some sort of a geomagnetic reverberation effect between the Earth and Moon, (c) a generation of internal gravity waves for several days prior to and after the eclipse [6]. Pulsations can have with these effects causal correlation. Time of registrations of pulsations in Kiel on 27-30 June was symmetric relatively of time range of the eclipse on 28 June, i.e., ± 29 hours. Therefore we suppose correlations the Tunguska event with secular effects of eclipses on the basis of 18.6-yr tidal term.

The discrepancy in the secular evolution of the Moon longitude (the big bump) was observed in the beginning of 20th century (1900–1920). It is a historically old problem [7]. It has been suggested that the Sun possibly emits scalar waves in a long-range, i.e., zero-mass chargeless, scalar fields. According to R. Dicke [8], the discrepancy in the secular evolution of the Moon longitude in the beginning of the 20th century was possibly caused by the Moon passage through a stream of scalar waves. Remarkably, that the period of time of the discrepancy in the Moon longitude includes also the year of the Tunguska event [9]. Thus one may assume the Moon passage through a stream of Sun scalar waves during eclipse 28 June, 1908. In addition, scientists observed magnetic vortical structures and a large protuberance on the Sun at that time [10]. Formation of the mascon (concentration of mass) of about 10^{11} kg inside the area of the lunar umbra at the altitude of 8.5 km during solar eclipses has been already assumed [5]. Using same arguments we suppose that such a mascon could form on 28 June, 1908 and has been apparently able to reach Siberia on 30 June, 1908 [9]. Our hypothesis has a surprising correlation with results of recalculation for the seismic data [11] where it has been shown that the Tunguska object had a weight ~ 10^{11} kg, and that explosion has occurred in height of 8.5 km. By our previous statements maskon possibly could be as effect of anomalous tide, however not on/in the solid Earth, but in the atmosphere.

Conclusion

We assert that the Tunguska event was most probably a tectonic explosion of the kimberlite paleovolcano caused by a gravitational phenomena about a time of the solar eclipse 28 June, 1908, but not an encounter of the Earth with space-bodies.

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