

### Terrestrial nuclear reactor

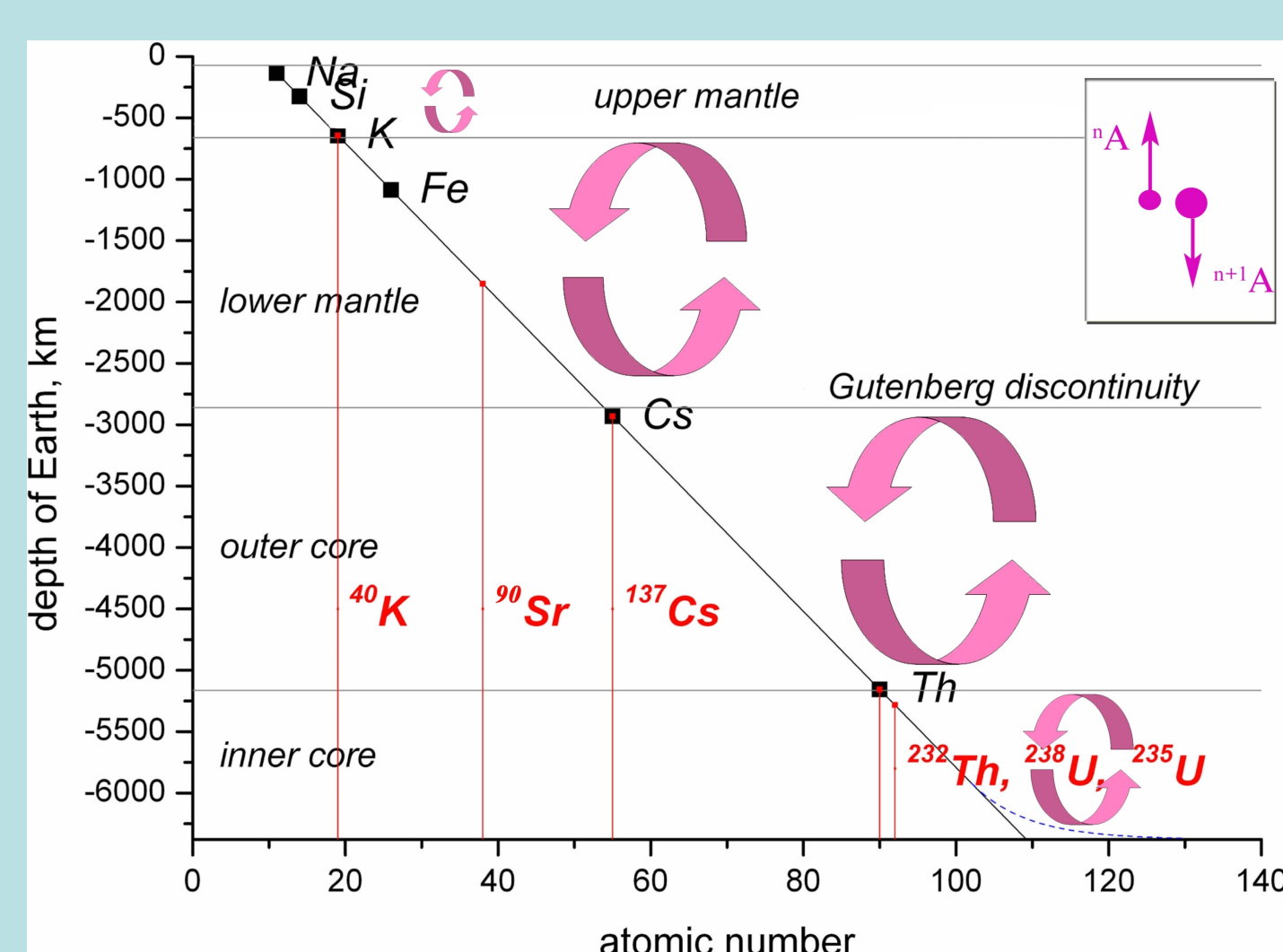


Figure 1. The scheme of terrestrial nuclear reactor based on isotope buoyancy theory is presented. The red lines show the basic fuel elements, such as  $^{40}\text{K}$ ,  $^{232}\text{Th}$ ,  $^{235}\text{U}$ ,  $^{238}\text{U}$  and major products of decay such as  $^{137}\text{Cs}$  and  $^{90}\text{Sr}$ . The Sr decay level is degenerated in the "cold" planet. On plate, the buoyancy theory principal: the heavy element  $n+1A$  sinks down; the light element  $nA$  floats up.

### Georeactor and geoneutrino

The main reaction of geoneutrino (antineutrino,  $\bar{\nu}_e$ ) registration from natural sources is the inverse beta decay reaction:

$$\bar{\nu}_e + p \rightarrow e^+ + n \quad Q = 1.806 \text{ MeV} \quad (1)$$

The significant difference consists in the following:  $^{40}\text{K}$  and  $^{235}\text{U}$  fuel layers cannot be determined by using inverse beta decay reactions. The lower threshold of inverse beta decay reaction is equal to 1.806 MeV, while the upper boundaries of  $^{40}\text{K}$  and  $^{235}\text{U}$  geoneutrino spectra are below this value. Thus, the  $^{40}\text{K}$  yield is equal to 1.311 MeV, see Equation 2:

$$^{40}\text{K} \rightarrow ^{40}\text{Ca} + e^- + \bar{\nu}_e \quad Q = 1.311 \text{ MeV} \quad (2)$$

Except to neglect the decay chains of  $^{40}\text{K}$  and  $^{235}\text{U}$  isotopes, the natural reactor power calculation method also neglects the decays of  $^{87}\text{Rb}$ ,  $^{138}\text{La}$ ,  $^{176}\text{Lu}$ ,  $^{232}\text{Th}$  and  $^{238}\text{U}$ .

Discussion sometimes takes forms far beyond the limits scientific knowledge. So the conflict between Herndon, the pioneer of geo reactor studying, and his NSF opponents turned into an open troublesome conflict [126]. In this study, we note that neither Herndon nor his opponents were right. The possibility of registration only minor fuel elements ( $^{232}\text{Th}$  and  $^{235}\text{U}$ ) casts doubt on advisability of carrying out the long and expensive experiments such as the KamLAND and Borexino Experiments.

### The effusive mechanism of volcanic eruption

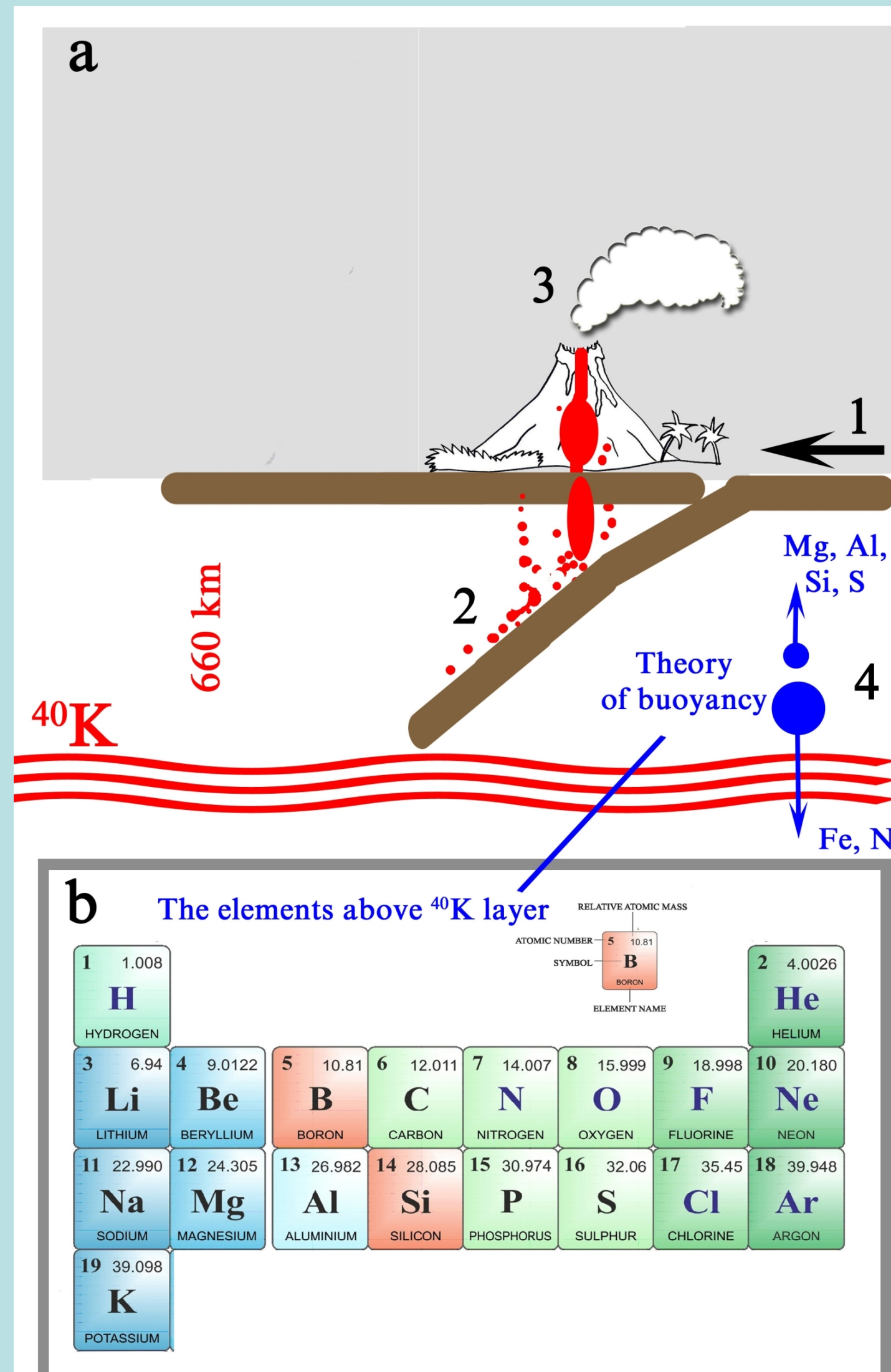
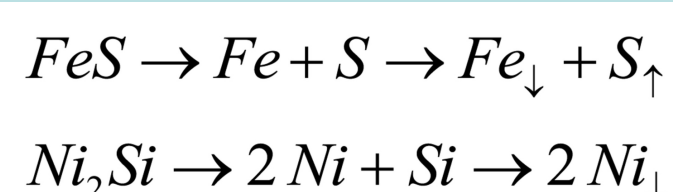


Figure 2. (a) - The scheme of effusive mechanism of volcanic eruption, in which it was demonstrated that the presence hot nuclear  $^{40}\text{K}$  fuel layer on the border of upper mantle and low mantle. (b) - the part of the periodic table with elements, allocated above hot fuel nuclear  $^{40}\text{K}$  layer. Number labels indicate: (1) - influence of a hot fuel layer on the continent drift; (2) - on the process of subduction; (3) - process of effusive volcano eruption.

### Elemental buoyancy theory

As it is known, the chemical composition of volcanic gases is mainly determined by water vapor,  $\text{CO}_2$ ,  $\text{CO}$ ,  $\text{N}_2$ ,  $\text{SO}_2$ ,  $\text{SO}$ ,  $\text{S}_2$ ,  $\text{H}_2$ ,  $\text{NH}_3$ ,  $\text{HCl}$ ,  $\text{HF}$ ,  $\text{H}_2\text{S}$ ,  $\text{CH}_4$ ,  $\text{H}_3\text{BO}_3$ ,  $\text{Cl}$  and  $\text{Ar}$ , that is, it consists of the chemical elements presented in the upper part of the periodic table (Figure 2b). Light elements, such as  $\text{Mg}$ ,  $\text{Al}$ ,  $\text{Si}$  and  $\text{S}$ , will float up, and elements heavier than  $\text{K}$ , such as  $\text{Fe}$  and  $\text{Ni}$ , will sink down, Figure 2a. Thus, in volcanic ashes, gases and lavas, sulfur compounds are found in large quantities, but elements, such as  $\text{Ag}$ ,  $\text{Au}$ ,  $\text{Pt}$  or more heavy  $\text{Th}$  and  $\text{U}$ , are extremely rarely found, due to they allocated deeply into the Earth.



### Fist Conclusion

The  $^{40}\text{K}$  fuel layer is the basis of new theory of volcanology and seismology, subduction and continental drift.

### Abstract

In this study we developed new effusive and explosive of volcanic eruptions. New explanation of eruption mechanisms was done by using the Elemental Buoyancy Theory and new K-Th-U structure of Earth, developed early by author. During investigation of effusive eruptions it was give clear answer on the question why the light chemical elements, mainly silicon and sulfur compound, currently dominate in the volcanic ashes, gases, and in the magma lavas. At investigation of explosive mechanism we analyzed 38 strong eruptions with Volcanic Explosivity Index (VEI) more than 4+. It was shown that there are link between the planet configurations and volcanic eruptions. It can found that volcano eruptions occurred at the different types of planet alignments. The phenomenon does depend neither on planet mass nor from the relative positions of planets. Also the phenomenon does not depend on the distance between planets, but often eruptions were observed when the distances between planets are multiple units. Also in work it was demonstrated that the planet alignment affect not only on natural processes on the Earth, but also impact on the Sun activity. Based on the comparison phenomenon on the Earth and Sun, we get new mechanism to rapid rising up pressure under the lithospheric planes by gravity vortexes. This gravity vortex was called as terrestrial magmatic protuberances.

### The three well-known astronomers Archimedes, Johannes Kepler and Johann Elert Bode



Figure 8. The sculpture and portraits of three well-known astronomers, namely Archimedes (a), Johannes Kepler (c) and Johann Elert Bode (e) are presented. In the low row the pages, illustrated their works and early discussed in the text, were shown. Labels are next: (a) - Sculpture of philosopher with a wet hair, which was lift up from Mediterranean Sea bottom together with Antikythera Mechanism. Very likely it is sculpture of Archimedes, see details in (Safronov 2020b); (c) - portrait of Johannes Kepler by an unknown artist, 1610; (d) - The original diagram of Jupiter-Saturn conjunctions prepared by J. Kepler in (Kepler 1606); (e) - portrait of Johann Elert Bode (1747-1826); (f) - illustration of Uranographia (Bode 1801). Red arrow presents the stellar alignment in Orion belts, referenced in Bible's Book of Job 38:31.

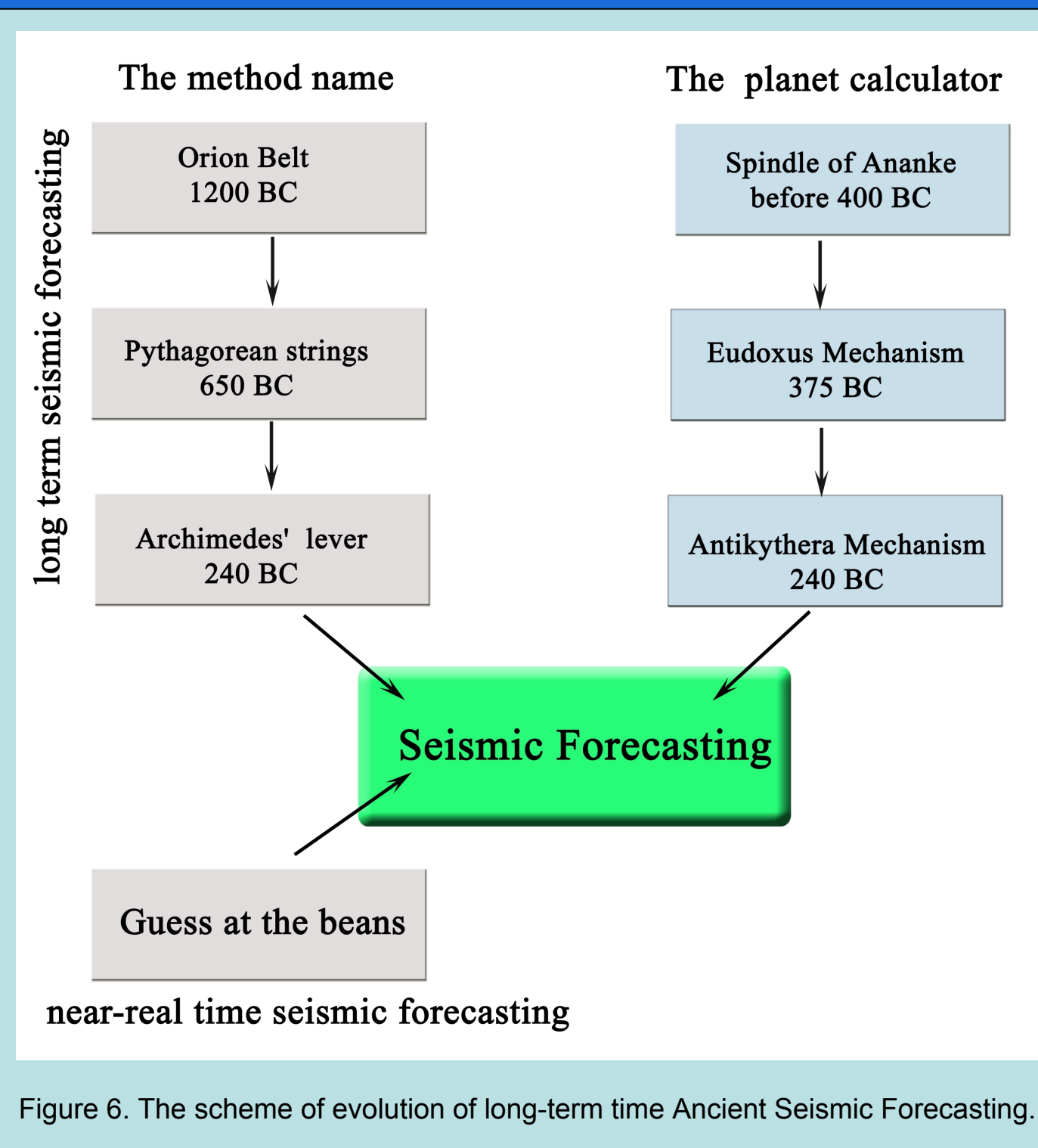


Figure 6. The scheme of evolution of long-term time Ancient Seismic Forecasting.

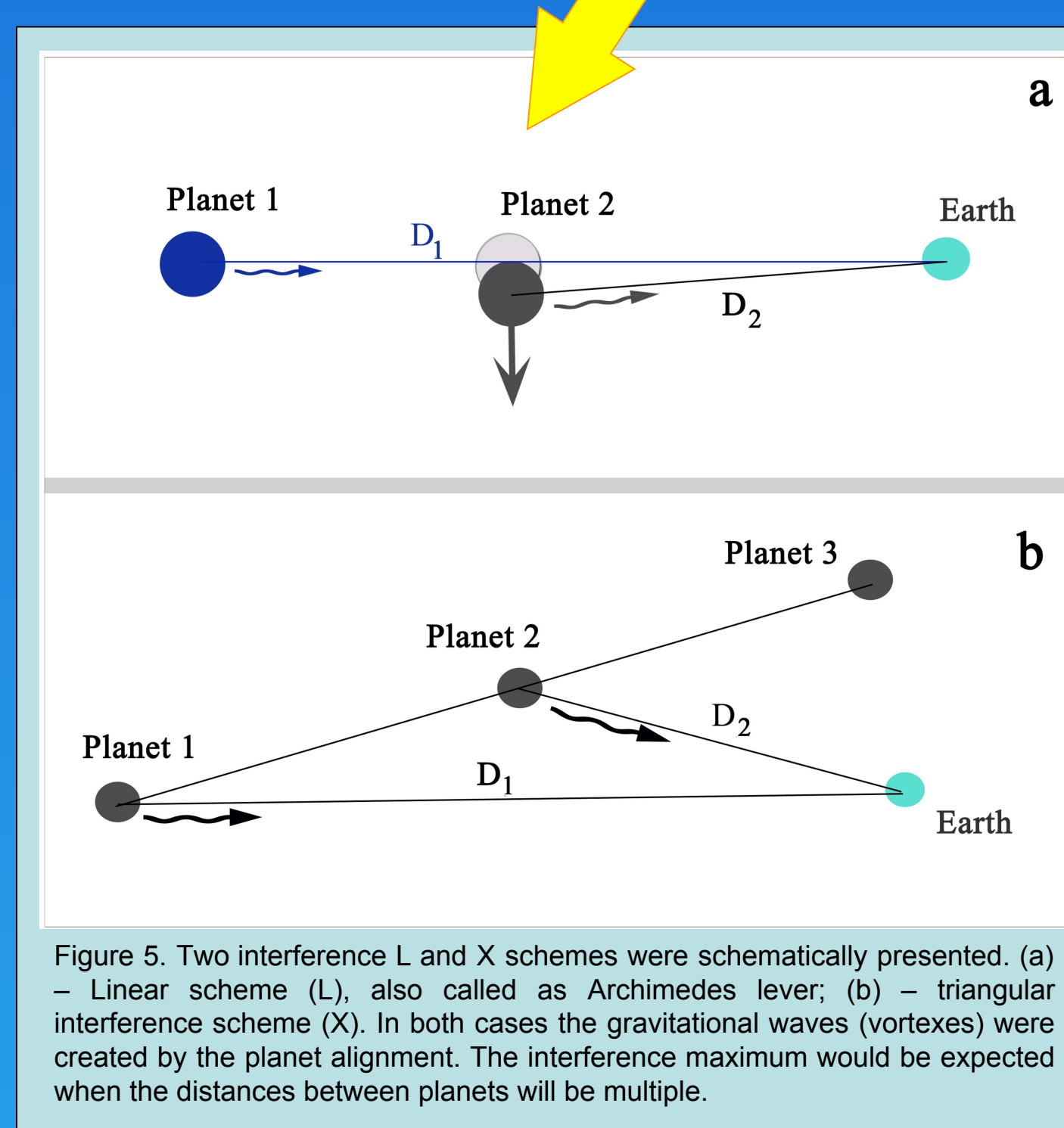


Figure 5. Two interference L and X schemes were schematically presented. (a) - Linear scheme (L), also called as Archimedes lever; (b) - triangular interference scheme (X). In both cases the gravitational waves (vortexes) were created by the planet alignment. The interference maximum would be expected when the distances between planets will be multiple.

### The explosive mechanism of volcanic eruption

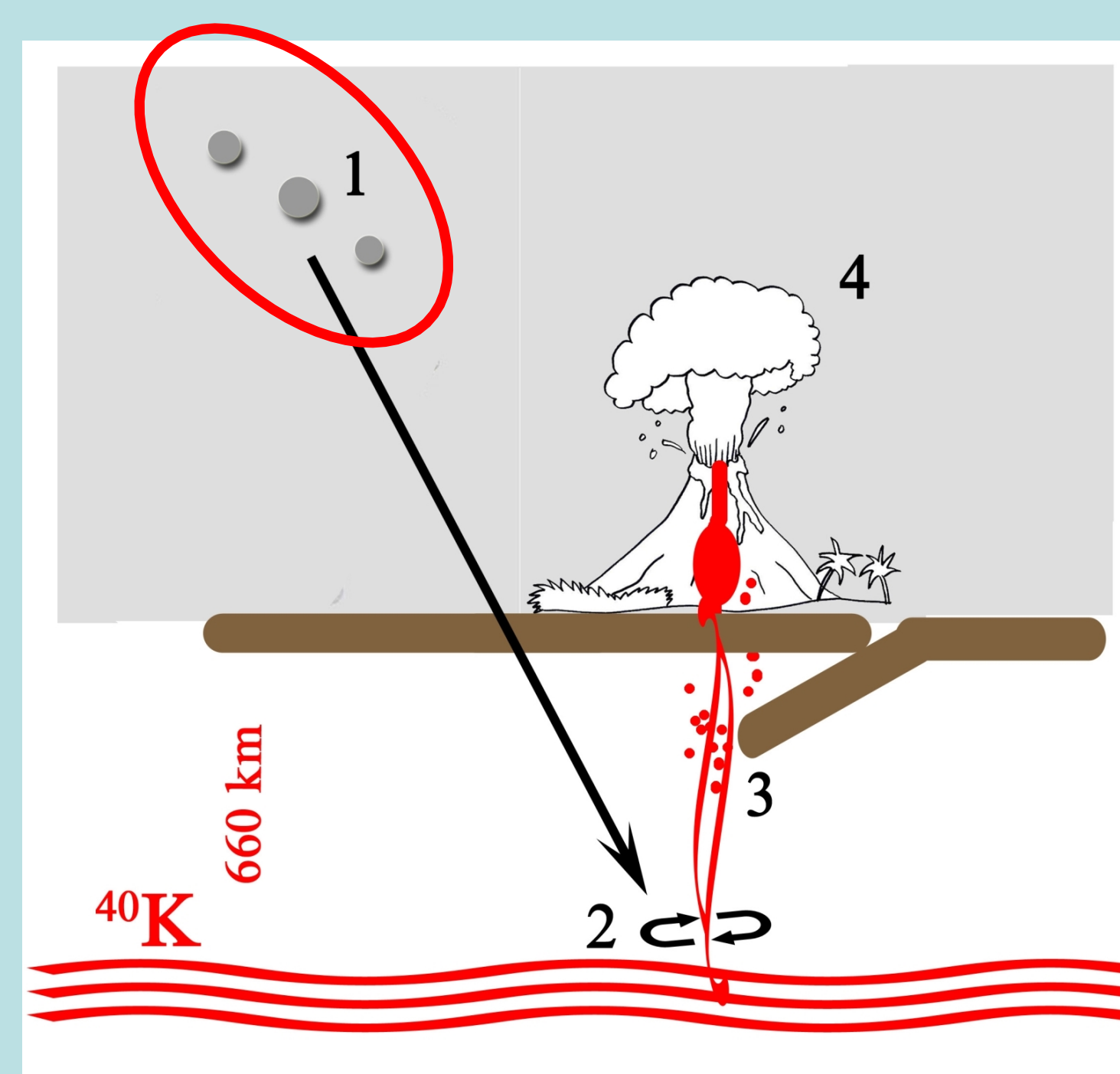


Figure 3. (a) - The scheme of explosive mechanism of volcanic eruption. Number labels indicate: (1) - astronomical event; (2) - gravity vortex; (3) - terrestrial protuberance; (4) - process of explosive volcano eruption.

### The solar super storms

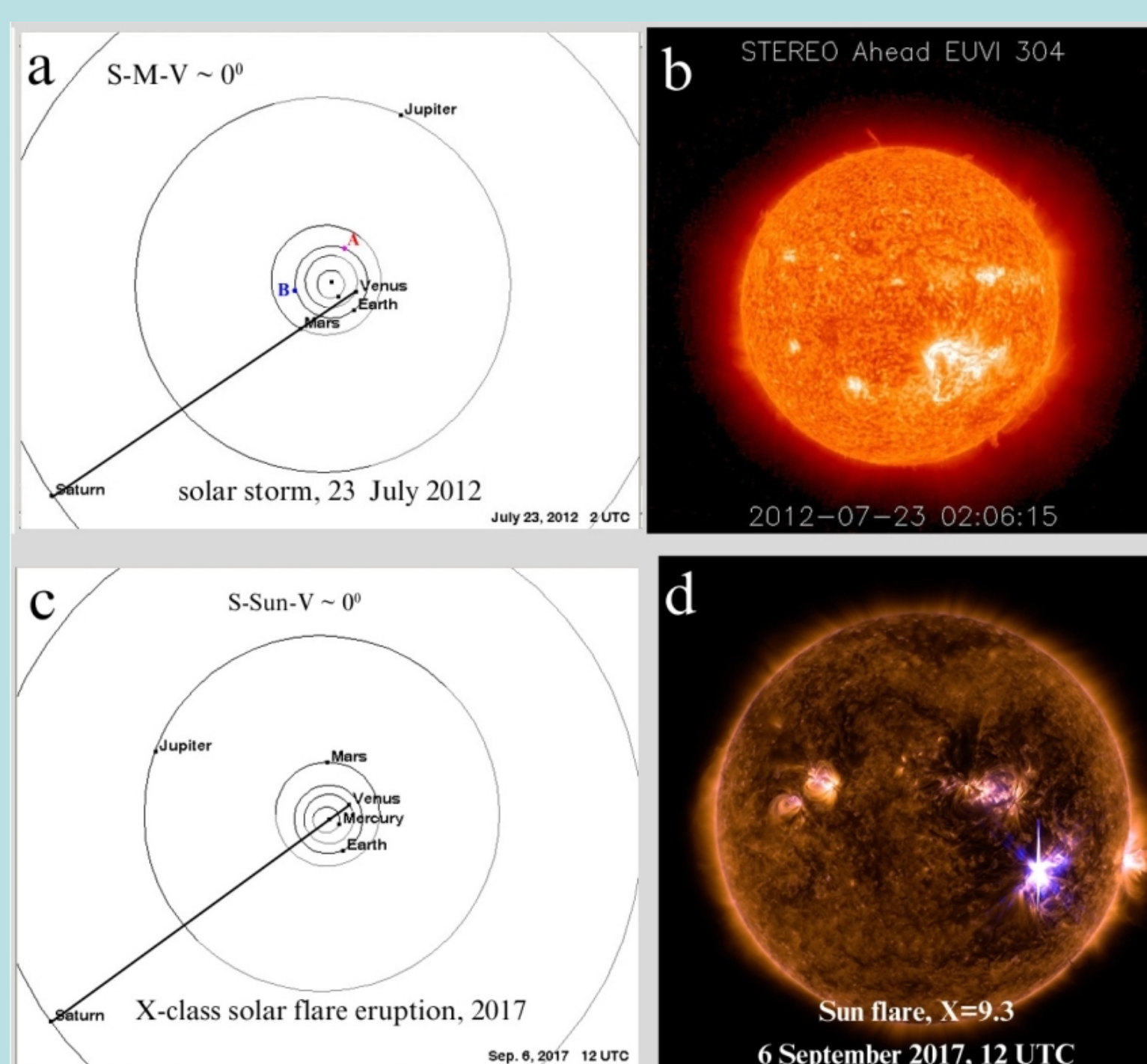


Figure 6. (a) - The Saturn-Mars-Venus planet alignment for the solar super storm at 23 July 2012, 2 UTC. The STEREO A and B satellite positions are shown as A and B symbols; (b) - the solar super image 23.07.2012 which was obtained by STEREO A; (c) - Saturn-Sun-Venus planet alignment for the strong X9.3 class Sun flare at 6 September 2017, 12 UTC; (d) - SOHO satellite image (PIA21949) at 6 September 2017, 12 UTC.

### The climatic significant eruptions: St. Helen (1980), El Chichón (1982), Pinatubo eruption (1991)

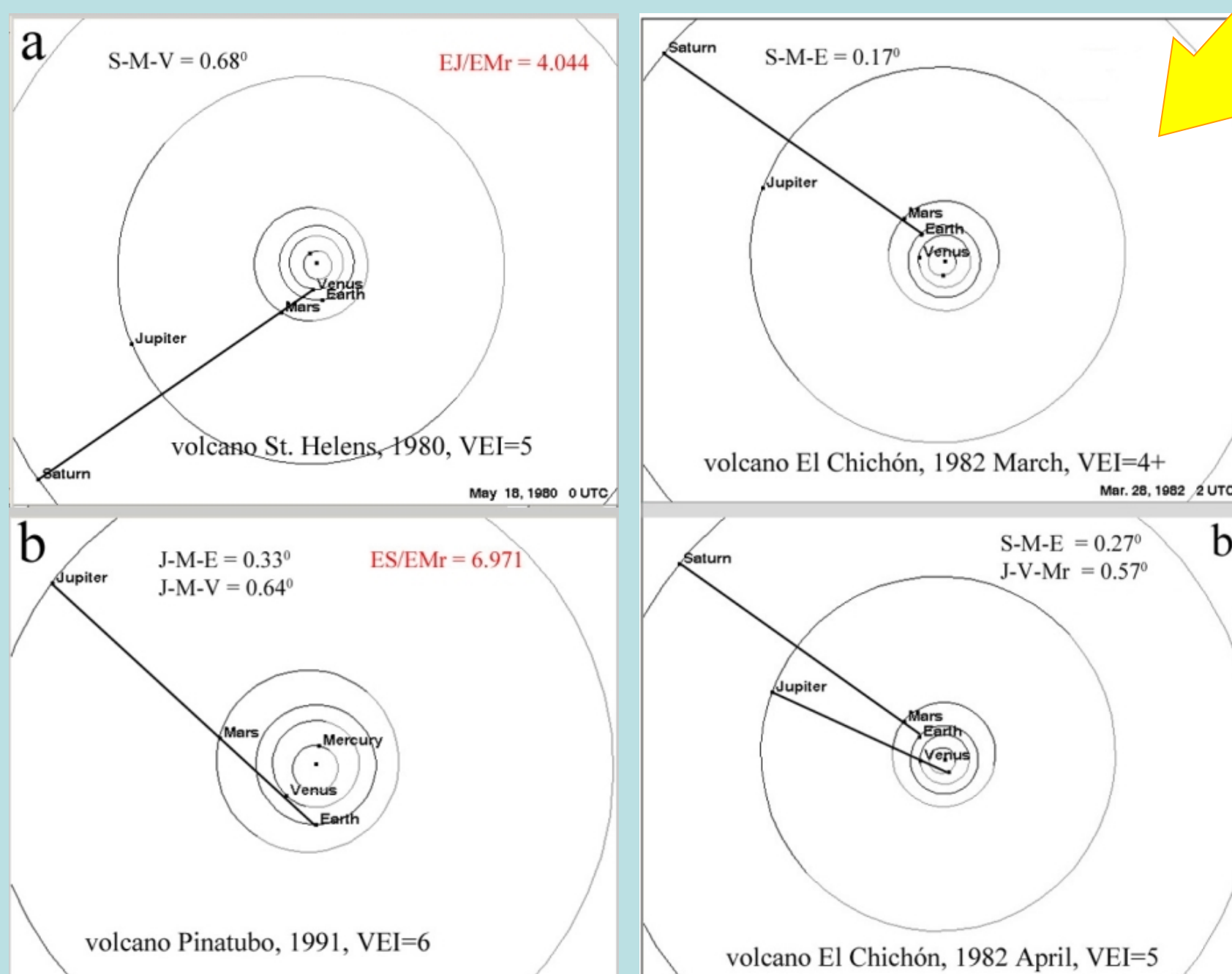


Figure 3. The climatic significant eruptions: St. Helen (1980), VEI=5, with the Saturn Mars Venus alignment; Pinatubo eruption (1991), VEI=6, with the 4 planet Jupiter Mars Venus Earth alignment; El Chichón eruption in March 1982, VEI=4+ at the Saturn Mars Earth alignment; El Chichón eruption in April 1982, VEI=5 at the Saturn Mars Earth and Jupiter Venus Mercury alignments. The alignment angles were presented in additional.

### Table 3. The statistic of interference type for the planet alignments for volcano eruptions with VEI=4+.

Type	Alignment between	pcs.	in %
Sun	Sun and planets	21	30.43
L	Earth and planets	17	24.64
X	planets without Earth and Sun	12	17.39
MA	multi alignments	10	14.49
MP	multi planets alignments (objects > 3)	7	10.14
G	planets and Galaxy	2	2.90

### Table 2. Account of astronomical objects, involved in the planet alignment at the volcano eruption VEI > 4.

Object	pcs.	in %
Sun	23	14.65
Mercury	15	9.55
Venus	22	14.01
Earth	22	14.01
Mars	25	15.92
Jupiter	24	15.29
Saturn	17	10.83
Uranus	2	1.27
Neptune	5	3.18
Galaxy	2	1.27

### Table 1. The planet alignment with angle less than 0.5° for largest volcano eruptions with VEI > 4+.

ID	Figure	Volcano Name	VEI Max	Event Date	Volcano Type	Planet alignment	Interference Type
Planets alignments							
1	1a	St. Helens	5	18.05.1980	Stratovolcano	S-M-V	X
2	1b	Pinatubo	6	15.06.1991	Stratovolcano	J-M-V-E	L
3	1c	Fuji	5	15.12.1707	Stratovolcano	S-E-M	L
4	1d	Longgang	5	08.10.1822	Stratovolcano	S-E-Mr	L
5	3a	Vesuvius	5	16.12.1631	Complex volcano	E-V-Mr	L
6	3b	Gamkonora	5	20.05.1673	Stratovolcano	M-V-E	L
7	4a	El Chichón	5	28.03.1875	Tuff cone	S-M-E	L
8	4b	El Chichón	5	27.05.1982	Tuff cone	S-M-V	L
9	5a	Colima	4+	20.01.1913	Stratovolcano	J-M-Mr	X
10	5b	Tolbachik	4+	06.07.1975		J-M-V	X
11	6a	Askja	5	29.03.1875	Stratovolcano	S-V-E	L
12	6b	Bezymianny	5	30.03.1956	Stratovolcano	J-M-Mr	X, G
13	7a	Katla	5	11.05.1721	Subglacial volcano	N-M-S	X
14	7b	Santa Maria	6	24.10.1902	Stratovolcano	N-J-S	X
Planets and Sun alignments							
15	8a	Shikotsu	5	19.08.1739	Caldera	J-Sun-Mr	Sun
16	8b	Cosiguina	5	20.01.1835	Stratovolcano	M-Sun-Mr	Sun
17	9a	Huaynaputina	6	19.02.1600	Stratovolcano	J-M-Sun	Sun
18	9b	Novarupta	6	06.06.1912	Caldera	S-V-Sun	Sun
19	10a	Shikotsu	5	23.09.1667	Caldera	G-E-Sun	Sun, G
20	10b	Hudson, Cerro	5	12.09.1991	Stratovolcano	J-Mr-V-E	L, G
21	11a	Komaga-Take	5	31.07.1640	Stratovolcano	J-Sun-V	Sun, L
22	11b	Puyehue-Cordon Caulle	5	04.06.2011	Stratovolcano	J-V-Mr-Sun	Sun, X

### Second Conclusion

It was shown that there are link between the planet configurations and volcanic eruptions. Based on the comparison phenomenon on the Earth and Sun, we get new mechanism to rapid rising up pressure under the lithospheric planes by gravity vortexes.