

A MODEL ON MUTUAL RELATIONSHIP BETWEEN ASTRONOMICAL GEOLOGICAL AND HUMAN SOCIETY

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Through three hundred years major historical events sequence revealing the rule and their samples of relationship between the Heaven Earth Mankind

Abstract: The author has comprehensively and systematically collected the historical data from 1715 to 2015, according to certain standards selected major historical events, constitute a time series matrix of astronomical phenomena, climatic meteorology, geological environment, economic science and technology, military conflict, international diplomacy, social politics and culture academic fields. Using mathematical statistics such as optimal partition, correlation spectrum analysis, chaos and fractal geometry, study the interrelationships of different elements. The results show, time evolution curve of the significant historical events quantity, has the characteristics of irreversible directivity, change synchronism, screen phased, fluctuation periodicity and fractal self-similarity. Astronomy, meteorology, geology and human society has a close and distant pedigree structure. The outbreak of astronomical phenomena on the Earth's human social system has a decisive constraint. In astronomical calm period, the Earth and human society displaying the sign of peace and prosperity, while the main changes occurred on the astronomical, the Earth and human systems will also adapt to the corresponding changes. The general temporal-spatial order of this process is Astronomy→Meteorology→Geology→Economy→Military→Diplomacy→Society→Culture, showing delayed characteristics of material energy and information dissemination. The author systematically summarized 300 years major historical events sequence of astronomy, meteorology, geology, human society-related, specific illustrates their interrelationships. This study has fully developed and deepened the concept of evolution of human history that the harmony among heaven earth man in ancient China.

Key words: Related patterns Astronomy Geology Human society 1715 - 2015 years

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Ancient China has its own unique thinking for the evolution of human history. Lao Tzu 's theory of Tao Te Ching:humans follow the earth, the Earth follows astronomy, astronomy follows the Taoism, Taoism follows nature. Confucius compiled "spring and autumn", at describing the major historical events of human society the same time, detailed records of astronomy, earthquake, weather and other phenomena, for future generations left valuable informations. Sima Qian asked himself: research on the occasion of heaven and man, proficient in ancient and modern changes, set up an own theoretical system. Dong Zhongshu 's theory of the induction between Heaven and Man think, heaven and man consistent with one.

Numerous studies have revealed the rise and fall of world civilization, dynastic change, the outbreak of war, population change and other social and economic changes, have a profound climate change background. Such as, the collapse of the Mayan civilization coincided with years of persistent drought; the main instability periods in continental Europe correspond to the periods of unusually cold climates. Climate change in agricultural society is mainly through the direct impact on food production fluctuations, thereby affecting the population increase and decrease, dynasty reign and other social and economic changes¹. China's catastrophe theory think, Chinese culture is the results that Chinese people sustained and strongly adapted to continuous and fierce natural disasters².

Astronomical geologists believe that, the Earth inevitably interacts with the surrounding cosmic bodies. Cyclical periodicity, directional evolution and phased catastrophe at the Earth evolution process, there may be cosmic factors³.

Through astronomy, geology, biology comprehensive research, scholars have found that they often have some common cycles, this allows we to explore the possible links between them. The Italian scholar presented the 2^k sequence with the cycles of a variety of heaven and earth phenomenon has a very good correspondence, and similar with the ancient Chinese Taiji eight trigrams concept⁴.

The author has collected a wide range of AD 1715-2015 years, important events occurring on a global scale, involving astronomy, meteorology, geology, hydrology, ecology, economy, military affairs, diplomacy, politics, thought, culture and other fields⁵⁻³⁰, with 'years' as the unit, arranged into a precise and complete time series. Through the comprehensive mathematical analysis to a time sequence, this paper development and deepening of the ancient Chinese concept of heaven-human history.

1. Research methodology framework

According to the following criteria, the author objective and comprehensive system to collect and collate 300 years of important historical events. Innovations of affect meaning: In the chain of events belonging to the initial sequence, breaking the world record, new discoveries and new inventions of science and technology. Events continue long: Generally from a few days to several years. Extensive of spatial scopes: county, city, province, state, country or the above. Involving a large number of peoples: earthquake level in more than M5.0, number of disaster more than a dozen people.

According to the some criteria, the paper has divided the important historical events by distinct fields.

Accordance with the field -time axis, the author has arranged important historical events, characterizes the variables with the number of events, constituted a data matrix. The method of mathematical statistics, such as optimal segmentation, correlation analysis, chaos and fractal geometry, is used to study.

2. Time evolution features of major historical events

The author has drew evolution curves of time-fields number of important historical events, this curve's shape is similar to the transfer function curve and the control step response curve, that zero initial condition under lintime invariant system. It is shown that the Heaven Earth Mankind system is a reflection and transfer function.

From which, we can see the following characteristics.

Irreversible directivity: Along with time continues to stretch forward, the number of people corresponding increase, science and technology increasingly developed, the number of major historical events more and more, the relationship between mankind and nature and the characteristic of human society itself has undergone significant changes.

The general trends is, political democratization, economic globalization, trade liberalization, multicultural conflict intensified, environmental pollution, man-land relationship tension, social conflicts lead to endless group events. The major historical events density: 1715-1800 ,16 pieces / year, 1801-1900 ,20 pieces / year, 1901-2000, 60 pieces / year, 2001-2015 ,120 pieces / year. With the evolution of time, the human system's response to input tends to intense, the transmission of

information tends to quicken.

Change's synchronism: With the evolution of time, the number of major historical events in different fields, showing the morphological characteristics of approximate synchronous changes. In the time structure by units of days, the general performance is the earliest astronomical events, then the weather changes, geological events follow, finally, human's adaptations in the economic, military, diplomatic, social and cultural spheres. In the time structure of the annual scale, the events in different spheres has displayed by basic synchronization.

Curtain pattern stage nature: According to the time nodes of significant increase in the historical event numbers, we can divide the human history into certain amount of different stages that having their own characteristics. The first division is divided into 2 stages, the second division is divided into 3 stages, the third division is divided into 4 stages, the fourth division is divided into 5 stages, the fifth division divides 16 stages.

Fluctuating periodicity: the number changes of important historical events, showing a pattern of cyclical increase and decrease by phase 1-14 years, 30-60 years, 100-200 years, and 300 years, wave crest 3-6-9-18-28-41-94-116-123-170-182-263.

Fractal self-similarity: The part and the whole has similar evolution trend and structural characteristics. Part is the whole reduction, the whole is a partial expansion. The existence of fractional dimension and Feigenbaum's constant, is a strong evidence of chaos and fractal characteristics of the system.³¹,

Between the time differences $X = \Delta t$ and the difference averages of the total number of events $Y = \Delta \Sigma$, there is a apparent linear relationship, we can establish the regression equation:

$$\text{Lg}Y = 0.8671 \text{Lg}X - 0.2462 \quad \gamma = 0.9764 \quad n = 17 \quad \gamma_{0.05} = 0.4821$$

Where the slope of the curve $a = 0.8671$ is the fractional dimension.

The computation of ratio $(Y_{n+1} - Y_n) / (Y_{n+2} - Y_{n+1})$, we can obtain a set of local maxima > 1.2 , calculate their arithmetic mean, the overall limit 4.6348 is obtained, quite close Feigenblue $\delta = 4.669$.

Table 1 Optimal partition of astronomical geological and human society history in 1715-2015

stage	1 time	2 times	3 times	4 times	5 times	continue / year	Event density				
1	1715	1715	1715	1715	1715-1788	74	14.6				
2						1789-1875	87	18.6			
3						1876-1900	25	26.4			
4					1901	1901	1901	1901-1910	10	30.4	
5									1911-1916	6	53.3
6									1917-1927	11	66.1
7									1928-1942	15	78.4
8									1943-1949	7	83.9
9									1950-1967	18	56.7
10									1968-1978	11	51.9
11									1979-1991	13	62.1
12									1992-2003	12	56.0
13									2004-2005	2	146.5
14	2014	2006	2006	2006	2006-2008	3	73.7				
			2008	2008							
15			2009	2009				2009-2014	6	139.7	
	2014	2014	2014	2014							
16	2015	2015	2015	2015	2015	1	263				

3. Related pedigrees of astronomical geology human society

The data matrix is analyzed, according to the correlative coefficients, we can establish the pedigree structure between astronomy, meteorology, geology and human society: social politics and military conflict with the most closely. Followed by economic science and technology, international diplomacy and cultural art, constitute the human social system. They are correlated at the correlative by coefficient $\gamma = 0.7072-0.5599$. Astronomical and meteorological systems are related by the correlative coefficient $\gamma = 0.6293$, geological environment and the human system to the correlative coefficient $\gamma = 0.5185$ level. Finally, the astronomical meteorological system and the human-earth system to relate by the correlative coefficient $\gamma = 0.4627$.

Table2 Division of historical stages of astronomy geology and human society

stage	Start-stop	Characteristics of natural and social development
1	1715-1788	Halley's comet regression, El Nino event, France drought, the Enlightenment challenges monarchy, American war of independence, China's Kangxi and Qianlong flourishing age
2	1789-1875	Eurasian low-temperature famine, Overproduction crisis, French democratic republic and autocratic restoration, East-West trade wars, the Taiping Heavenly Kingdom challenged the Qing Dynasty
3	1876-1900	Yangtze flood, The rise of the European workers' movement, China's Westernization Movement, Japan Meiji Reformation
4	1901-1910	Drought in North China, Boxer movement to open the East-West cultural conflict, China's Qing dynasty to preparations for constitutionalism
5	1911-1916	Halley's comet regression, Yangtze River flood, Chinese Xinhai revolution, SunYatsen's democratic constitutionalism and Yuan Shikai's authoritarian restoration
6	1917-1927	European pandemic influenza, Russian communist revolution, the Chinese warlords, the First World War
7	1928-1942	Drought in northern China, the world economic crisis, the rise of Germany-Italy-Japan fascist forces, launched the second world war, of Chinese KMT-CPC civil war
8	1943-1949	Drought in Southern China, the fascism forces decline and fall, the United Nations was founded, China's Communist regime
9	1950-1967	Solar storm, China's great famine, East and West two camps cold war, communist group internal conflict
10	1968-1978	Cosmic γ -ray burst, CPC's higher power struggle touched off social unrest, Southeast Asian expansion of Communist movement
11	1979-1991	Halley's comet regression, volcanic eruptions, Yangtze River flood, Chernobyl nuclear leak, End of the cold war, China's reform and opening up, the violent change of the pre-Soviet Union and Eastern Europe, Taiwan's democratically elected President
12	1992-2003	Intense period of solar activity, Antarctic ozone hole, Climate anomalies, Geological disasters frequently, the world population of 6 billion, Economic Integration, Regional ethnic conflicts
13	2004-2005	Cosmic γ -ray burst, China's arid desertification increases, Social contradictions

		intensified, Violent conflict events happened frequently
14	2006-2008	global warming, Climate change, Economic slowdown, financial crisis
15	2009-2014	Climate anomalies, frequent earthquakes, China is shrouded by haze, the stock market ups and downs, Group events emerge in endlessly
16	2015-	Annual average temperature refresh history record. Scholars warned the earth into the period of sixth biological extinction. China's social transformation to the key point

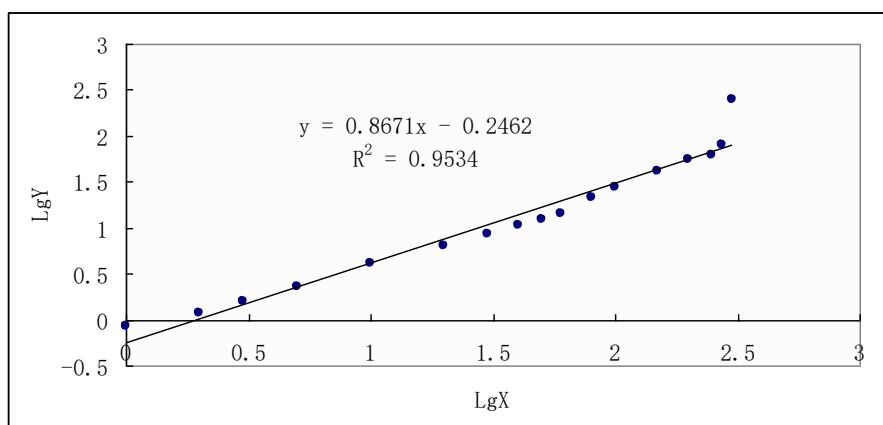
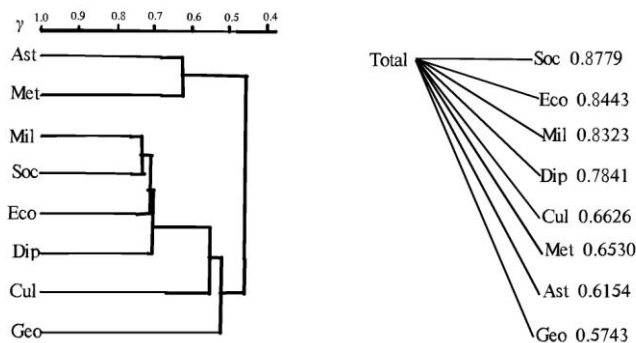


Figure 2 Fractal model of number change of important historical events in 1715-2015

The correlative coefficients between various factors and the total number of major historical events: Social and political 0.8779, economy and science and technology 0.8443, military conflict 0.8323, international diplomacy 0.7841, cultural and art 0.6626, climate meteorology 0.6530, astronomical phenomena 0.6154, geological environment 0.5743, reflect the order of the size that their contribution factor to important historical events ($\gamma_{0.05}=0.1130$).



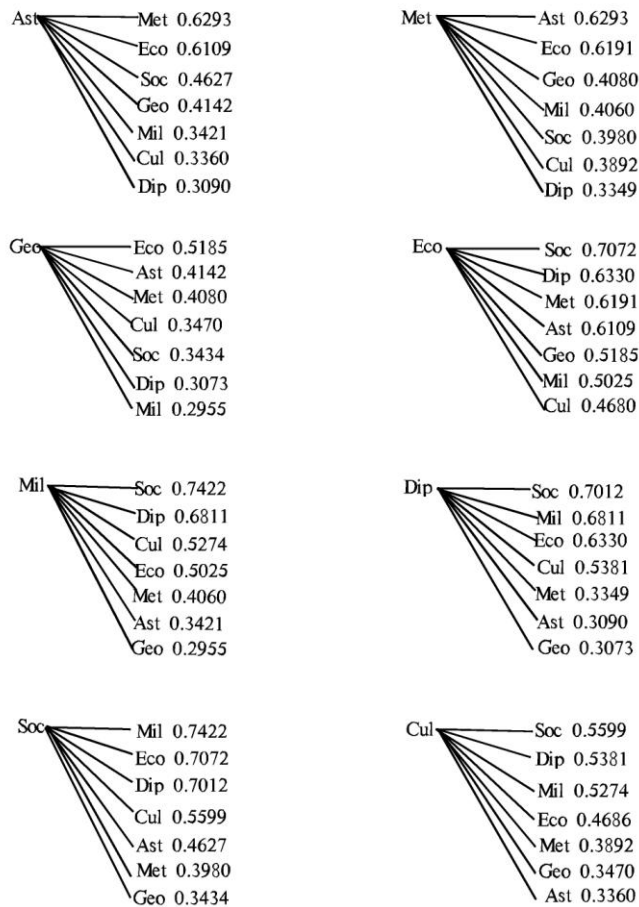


Figure 3 Pedigree structure diagram of astronomical geological and human society







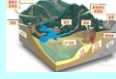











4. Temporal-spatial structure of the interaction model of astronomy geology and human society

The outbreak of astronomical phenomena to the Earth's human social system has a decisive constraint function. When the astronomical calm period, the Earth system is also relatively stable. When significant changes occur in astronomy, the Earth and human systems will accordingly adapt reflect, to adaptable change.

The general rule : Comet regression - flooding overflow - earthquake landslides and mudslides-famine people change - uprising revolution - change of dynasties – modern and post-modern art; Supernova explosion, solar storm, X-ray, γ ray burst ,temperature rises, climate anomalies, drought locusts, water system cut off, desertification - social conflict group incidents-diplomatic dispute –high-handed stabilization - rebel art.

Generally temporal-spatial sequence of this process: stromy \rightarrow meteorology \rightarrow geology \rightarrow economy \rightarrow military \rightarrow diplomacy \rightarrow society \rightarrow culture, showing the delay characteristics of material energy and information dissemination.

Figure 4 Temporal-spatial repercussion process illustration of astronomy geology and human society

Time - space sequence	Astronomical phenomenon	Climatic meteorology	Geological environment	Economic sci-technology	Military conflict	International diplomacy	Social politics	Cultural academic
								
								
								
								
								
								
								
								

The author systematically summarizes the correlate historical events sequences of astronomical, meteorological, geological and human society in the past 300 years, I believe that, there is some kind of inherent connection between them, not just a coincidence in time.

5. Evolution concept of human history of heaven earth human being harmony and unity

German school of natural philosophy represented by Friedrich Schelling and Lorenz Oken, thinks man is the epitome of the universe. Human beings are the final product of the development of the universe, Humans summarized the contents of the previous stages of development, representing the entire world of miniature images. Through introducing the time factor, Lamarck puts the static, descending existence chains into a dynamic, incremental evolution chains. When the external environment changes, biological kingdom there will be an objective need, resulting in variation, in order to adapt themselves to the environment. Bergson digs out the real time – Duration. The real

meaning of being is to change and mature, Is to continue to create their own, means the creation of new forms and the absolute novel things in the ongoing process of production. Emergence of evolution means that in the course of time, the steady stream of new quality, Unusual and profound features. Emerging evolution is an imperfect evolution, it has a directional, it will lead to things in a more advanced direction of evolution³².

According to Lee Smolin, Our present universe is characterized by structure and complexity on a wide range of scales. We look back is a universe evolving from equilibrium to complexity! Evolving complexity means time! There has never been a static complex system. Systems held together by gravity behave strangely. Stars, stellar systems, galaxies, and black holes are all anti-thermodynamic. They cool down when you put energy into them, and heat up if you take it out. Thus they are unstable, which leads to the formation of patterns in space and time. The progress of human civilization is the result of the disciplined application of imagination, which let us to adapt to novel environments. The bargain of human life is to thrive on the cusp of uncertainty. For on every scale, from an atom's quantum state to the cosmos, and at every level of complexity, the key is time, and the future is open³³.

Supernova burst, gamma ray surge, comet regression, meteoric shower, sunspot magnetic storm, activity scale and influence intensity of these astronomical phenomena have a specific period and cyclical nature. When in the quiet period of astronomical activity, the Earth's climate weather performance was favourable weather, human society more energy for the development of production, revitalize the economy, leading to scientific and technological progress, population growth. But also bring the polarization between the rich and the poor, class contradictions continue to accumulate. When the astronomical activities in active period, the Earth's climate is often abnormal, or flood or drought, cold and hunger refugees in the disaster areas, In order to survive had to rise up rebellion.

The driven of Human psychological needs pyramid of survival, security, Eros, honor, power, as well as individual differences in intelligence, resulting in potentials of class differentiation. In the face of challenges facing the current regime, some people who power desires are particularly strong, taking advantage of the public resistance time, when the world, put forward some may be popular theory, to win the most people trust and support, to carry out my life and your death struggle get along with vested interests, and then achieve the purpose of seizing power, resulting in a number of emerging elites. Change dynasties, Vientiane update, the history has entered into the so-called new era. This human history is cycling so again and again, go round and round.

. Refer to the astronomical influences on human life, someone raised the hypothesis of magnetized nerve, radon concentration increase and luminous absorption. In fact, the influence of astronomical factors on meteorology and earthquake subject to the inevitable decisive physics laws, and the influence of astronomical geologic factors on human society subject to multiple statistical laws, specific to the individual differences are very significant.

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Synopsis of the author

Jin-Zhong GONG (1962—), male, 1983 graduated from the China University of Geosciences (Wuhan) geochemical exploration professional, now as a professor, 30 papers published articles and published three books.

Appendix1 Domain classification of major historical events

Domain	standard of classification
Ast-Astronomical phenomenon	Comet near-the Earth regression, meteor shower broke out, solar storm large sunspots flares, meteorite fall, nova - supernova outbreak, planetary opposition rendezvous dust storms, solar lunar eclipse, X-ray and γ -ray burst, comet - Jupiter collided, Antarctic ozone hole, Galaxy collisions, moon surface light spots and many more
Met-Climatic meteorology	Storm flood, thick layer of snow, wind lightning, river burst, drought locusts, poor harvest famine, temperature anomalies, hail damage, high temperature hot, disease epidemic, fog haze acid rain, coastal storm surge, hurricane typhoon, tornadoes, dry hot wind, water system blanking, lake drying up, sandstorms desertification.
Geo-Geological environment	Earthquake tsunami, volcanic eruption, mountain collapse, ground fissures, land subsidence, crustal deformation, geomagnetic anomalies, geoelectric anomalies, seawater intrusion, river siltation suspended, glacier collapse, soil pollution
Eco-Economic science technology	Industrial and agricultural production, scientific theory, technological invention and progress, financial organizations, the stock market ups and downs, production accident, aviation disaster, policy, infrastructure, engineering project, overproduction, economic crisis, land and resources survey, UFO reports and so on
Mil-Military conflict	Major war campaigns, the country was invaded by the army, armed uprising, military exercises, group protests, the central government to put down the rebellion, the soldiers mutiny, the royal family coup murders, workers strike, anti-tax donation, rights struggle, theft robbery, cultural and religious conflict, student strike and so on
Dip-International diplomacy	State visits, two-way treaty, border trade agreements, national declaration of independence, offensive and defensive alliance, mission negotiations, international conferences, regulations of trade, the signing of the contract and so on

Soc-Social politics	Changes in state power, the people's uprising revolution, the government summit meeting, administrative regulations, appointment and removal of personnel, election of leaders in competition, system reform, mass movement, high-handed persecution, isolation and censorship, peaceful evolution, dissolution of Congress, social control, conspiracy assassination, maintenance of stability, and so on
Cul-Cultural art	Academic papers, literary works, drama music, film and television, forum speeches, social groups, festivals celebrations and so on

Appendix 2 Correlate historical events sequences of astronomical, meteorological, geological and human society in the past 300 years

- 1645-1715, Solar activity Mond minimal period, Global temperature drops, World famine, The Qing army entered Shanhaiguan.
- 1759-1776, Halley's comet regression, Hebei flood, American war of Independence, Declaration of independence.
- 1781-1812, Straw hat galaxy is found, Earthquake tsunami, temperature fluctuation, the French revolution, the Declaration of human rights. C/1811F₁ come, Moscow cold winter, Napoleon withdraw troops from Russia, the army decline sharply.
- 1835-1847, Halley's comet regression, Yangtze River Huaihe Haihe flood, the first Opium war, Hong Xiuquan founded the Society of God Worshipers, London Union of Communists.
- 1859, Super solar storm, Anglo-French allied forces occupied Tianjin, Shidakai launch an attack, Darwin's theory of evolution.
- 1899-1901, the comet close to the earth, Zhili province drought, displaced persons into the city, Boxer riots were suppressed by coalition forces, the New Deal in the Late Qing Dynasty.
- 1910-1912, Halley's comet regression, Yangtze River floods, Hungry people to grab rice, Xinhai revolution, the Republic of China establish, Literary revolution.
- 1917, Sagittarius BS nova broke out, Russian bread shortage, the outbreak of the February revolution, the czar abdicated, Lenin launched the October Revolution.
- 1919, China coastal tide, extremely hot fierce wind and hailstone, Beijing anti-imperialist patriotic movement, Sunwen's theory.
- 1927-1937, the comets close to the Earth, Meteoric shower regression, Drought cholera, floods earthquakes, The world economic depression, China Kuomintang and the Communist civil war, Japanese intruded into China, the Second World War.

- 1946, Meteoric shower broke out, cold winter famine in northwestern Europe, United States Marshall Plan.
- 1950, Comet close to the Earth, Earthquake landslides, hail winds, the Korean war, China to strengthen the geological work.
- 1959-1960, Sun flame, many earthquakes, Lushan conference, Drought in North China, drying up of Yellow River, starved to death tens of millions of farmers.
- 1967-1968, γ ray radiation, China's army generals row Huarentang, Cultural Revolution, marching, suppress and armed fights, France Red May, "Cancer ward."
- 1969, X-ray radiation, Anti - Chinese riots, Military coup, "Slaughterhouse Five".
- 1970, the Comets close to the Earth, 8 grade earthquake, Meteoric shower, Tropical storm catastrophic floods, wheat production.
- 1971, Mars dust storms, Lin Biao and Mao Zedong break, defected to Mongolia, Lin Biao fatal crash died.
- 1972-1973, Sun strong flare, Yellow River Cut off, Hydrogen bomb experiment, Unknown Flying objects, Middle East War, volcanic eruptions.
- 1976, Jilin meteorite rain, Comet Wester, Tiananmen Square Four five Movement, rainstorm and mud-rock flow, Tangshan strong earthquake, Mao Zedong died, the Gang of Four was arrested.
- 1986-1991, Halley's comet regression, Chernobyl nuclear material leakage explosion, Large Magellanic Cloud Supernova, Serious riots in Lhasa, Tiananmen Square Massacre in Beijing, drastic changes in Eastern Europe, the disintegration of the Soviet Union.
- 1993, Strong γ -ray burst, Supernova eruption, large dust storms, geological disaster development, global chaos.
- 1994, A collision between comet - Jupiter, Extra large river pollution, Coastal astronomical tide.
- 1997, Coronal mass ejection, γ -ray burst, drying up of the Yellow River, air temperature rise, desertification in China.
- 1998, Solar storm, meteoric shower regression, Yangtze River flood, Earthquake and tsunami, Antarctic ozone hole, Congo Second War.
- 1999, the most powerful γ -ray bursts, air temperature rise, Religious persecution.
- 2000, Solar activity peak years, γ -ray burst, China's dust and locust, the Arctic ice caps melt, Demonstrations and petitions.
- 2001, γ -ray burst, Climate anomalies, Self-immolation false case, shijiazhuang extraordinarily violent bombing, Regime change.
- 2003-2004, Trevor supergiant Rho Cas mass outbreak, Solar flares, abnormal climate,

volcanic eruption, Atypical pneumonia, Anti-war demonstrations, hostage-taking, the Chinese government calls for a harmonious society.

- 2009, Supernova relics, Solar activity is minimal, the financial turmoil, science fiction disaster film.
- 2010-2011, Meteoric shower, solar eclipse, Heavy snow severe cold, China's southwest drought, high temperature floods in Asia, Solar magnetic storms, Greenland glacier collapse, Climate anomalies, group events, terrorist attacks.
- 2015, The volcanic eruption, drought heat wave, typhoon rainstorm, CCP anti-corruption windstorm, economic downturn, high-handed stability.

Figure 1-1 Numbers evolution of major history events of astronomy geology and human society in 1715-2015(overall)

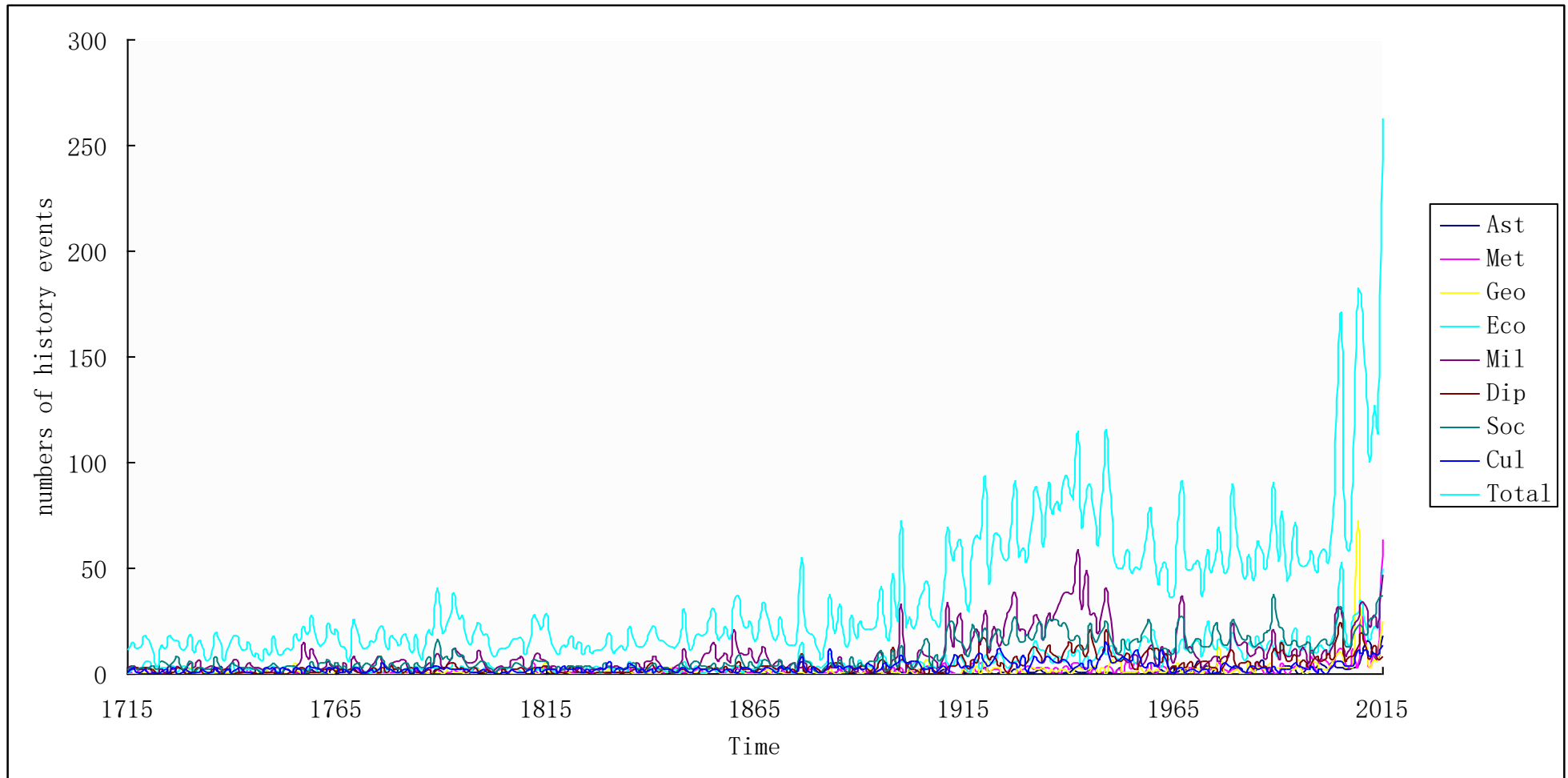


Figure 1-2 Numbers evolution of major history events of astronomy geology and human society in 1715-2015(subdivision)

