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## All the Sunlight that Earth Receives is not Directly from Sun

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**ABSTRACT:** For the first time, the most plausible explanation is provided with unprecedented detail why temperature varies with height from earth based on author's two previously reported breakthrough findings in physics. (i) <sup>235</sup>Uranium fission powers Sunlight phenomenon by Padmanabha Rao Effect [3]. (ii) Short wavelengths travel fast [4]. The current successful explanation on variation in atmospheric temperatures with height does not support the traditional wisdom that absorption of UV and X-rays by ozone, greenhouse gases vary the temperatures. The current paper unfolds that most Sunlight does not reach beyond 84 km height. The solar beta, gamma, and X-ray emissions from <sup>235</sup>Uranium fission products (radioisotopes) first produce Bharat Radiation, which in turn produce bright Sunlight which includes EUV, UV, visible light and near infrared radiation from 84 to 50 km height and again below 10 km height above earth. Essentially, the near infrared radiation is responsible for increase in atmospheric temperatures to around 17°C within 5 km height from the surface of the earth, while EUV is responsible for lowering atmospheric temperatures to sub-zero levels at 100 to 84 km height and again from 50 to 20 km height.

**KEYWORDS:** atmospheric temperature, X-rays, ozone, Greenhouse effect, Thermosphere, Mesosphere, Stratosphere, Troposphere, Uranium fission, fusion, Sunlight, Bharat radiation, EUV, UV, visible light, near infrared radiation, fission products.

### I. INTRODUCTION

For the first time, the most plausible explanation why temperatures vary at different heights above Earth is provided with unprecedented detail in the current paper, based on the latest progress in five subjects of physics that the author reported as four papers in 2010 and 2013 [1-4]. The current paper is further advancement to three breakthroughs made lately in physics: Discovery of Sun's Bharat Radiation emission causing Extreme Ultraviolet (EUV) and UV dominant optical radiation; discovery of Self-Sustained <sup>235</sup>U Fission causing Sunlight by Padmanabha Rao Effect; and discovery of superluminal velocities of X-rays and Bharat Radiation challenging the validity of Einstein's formula  $E = mc^2$  [2, 3, 4].

So far, the reasons attributed to temperature variation with height have been varying degrees of absorption of UV and X-rays due to different densities of gases present in the atmospheres at various heights above earth. Ozone layer absorbing UV, and greenhouse gases such as water vapor, methane and carbon dioxide in the atmosphere absorbing most of the Earth's emitted infrared radiation are the most popular views of the scientists today [5-9]. Precise explanation on temperature variation at different heights was not possible for previous researchers by mere absorption of UV, near infrared and X-ray radiations by oxygen, ozone and greenhouse gases.

The traditional wisdom believes in fusion in the Sun's core causing gamma rays, and when gamma rays reach surface of the Sun, their energies degrade to infrared (IR), visible light and UV spectrum [10], against gamma rays originating from radioisotopes described well in nuclear physics texts. When theory of fusion continued to dominate solar physics, a fundamental change has come in understanding of Sunlight phenomenon from fusion to fission in July 2013. An unprecedented atomic phenomenon, now known as Padmanabha Rao Effect explains clearly how beta, gamma or X-ray emission produces two more generations: (1) Bharat Radiation, and (2) UV dominant optical emission which includes UV, visible and near infrared radiations within the same excited atoms of radioisotopes available in the laboratory as well as of fission products produced by <sup>235</sup>Uranium fission on Sun's core surface [1, 3]. Therefore, solar gamma rays

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originate from  $^{235}\text{Uranium}$  fission products (radioisotopes) and not by fusion. Furthermore, fusion has no clue on (i) the source of solar X-ray, EUV, UV, visible, near infrared radiation emissions, (ii) why they all successively follow one another, and (iii) why low wavelengths travel fast.

The current paper highlights that the temperature variation at different heights takes place mainly for two reasons. (a) When  $^{235}\text{Uranium}$  fission takes place on Sun's core surface, the fission products first emit beta, gamma, and X-ray radiations, which in turn successively generate Bharat Radiation, which in turn generate EUV, UV, visible and near infrared radiations by valence excitation within the same excited atoms by Padmanabha Rao Effect [3]. (b) All these solar radiations have specific velocities depending upon their wavelength [4]. As a result, while beta, gamma, and X-rays travel they leave a trail of Bharat Radiation, EUV, UV, visible and near infrared radiations. Due to long wavelengths, the near infrared radiation is the first one to leave the trail of above solar emissions and causes high temperatures above 500 km height and again at 84 to 50 km height (fig.4,7). Visible light, Bharat radiation, UV, and EUV will leave the trail one after another and affect temperatures accordingly. The following key findings are first reported in this paper. (1) UV and EUV are shown lowering the atmospheric temperatures to sub-zero levels. (2) Bharat Radiation causes stable temperatures in Mesopause and Tropopause, the way visible light does in Stratopause. (3) Short wavelength solar emissions travel slow and cover less distance in space in conformity with the author's reported findings in September 2013 [4].

It is well known that Sun's surface called photosphere has over  $5500^{\circ}\text{C}$ , yet only a small fraction of the sun's energy emitted is in the direction of the earth [11]. Not all of the solar radiation arrived at the periphery of the atmosphere reaches the surfaces of the earth [7], to which the current paper subscribes fully well for the following reason. When solar electromagnetic radiations: EUV, UV, visible light and Bharat Radiation cannot go down beyond Mesopause around 84 km height, the remaining solar beta, gamma and X-ray emissions have caused the essential Sunlight including Bharat Radiation, EUV, UV, visible and near infrared radiations in both Mesosphere and within 5 km height above earth in troposphere. If this interpretation is true, fission really causes Sunlight.

The clue on temperature variation with height eluded from previous researchers due to inadequate laboratory studies simulating Sunlight phenomenon. The author's experimental research with radioisotopes and X-ray fluorescent (XRF) sources was the first step in this regard that led to the discovery of dominant UV (over 83% in gross light intensity), visible and near infrared radiation emissions caused by beta, gamma and X-ray emissions from within the same excited atoms [1]. However, the unexpected detection of optical emission from radioisotopes and XRF sources was most puzzling, since the essential prerequisite valence excitation into optical levels cannot be done by energetic beta, gamma or X-ray emission that essentially do ionization. That prompted the author to make the following important prediction. Beta, gamma or X-ray emission generate some previously unknown electromagnetic radiation with energy higher than that of UV at eV level within the same excited atom, termed 'Bharat Radiation', which in turn causes valence excitation and produce the experimentally detected UV dominant optical emission from both radioisotopes and XRF sources [1, 12-14].

The author has shown that in the case of Rb XRF source, Rb X-ray, Bharat Radiation (predicted) and UV wavelengths would successively lie in electromagnetic spectrum (fig.1,a) due to increase in wavelengths from X-rays to UV [1]. Likewise, solar physicists were able to successfully measure three distinct wavelength ranges lying successively in solar spectrum (fig.1,b); however faced difficulty in their identification since 1960 [2]. T. Burnight first observed solar X-rays during solar flares, and was confirmed by Yokoh in 1991 [10]. However their exact range of wavelengths in solar spectrum remained an unresolved issue until 2013. Likewise, the more distinct wavelength region from 12.87 to 31 nm that looks like a mountain, and another region beyond 31 nm remained clueless. In 2013, the author met with a major success when found an unexpected close similarity between these three successive solar wavelength regions and the three wavelengths regions in Rb XRF source spectrum that led to the first identification of solar X-rays up to 12.87 nm, Bharat radiation from 12.87 to 31 nm and EUV beyond 31 nm (figs 1 & 2). That is how Bharat radiation predicted from radioisotopes and XRF sources was evidently found in solar spectrum [2], giving birth to an unprecedented electromagnetic radiation in radiation physics with energies below that of X-rays and higher than that of UV or EUV at eV level.

Presence of Bharat radiation in solar spectrum pinpointed definite presence of radioisotopes on Sun's core surface. That led to the 'discovery of self-sustained  $^{235}\text{Uranium}$  fission causing Sunlight by Padmanabha Rao Effect' reported in July

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2013 [3]. Essentially, the findings show that beta, gamma, X-ray emissions, Bharat Radiation, EUV, UV, visible, and near infrared radiations start simultaneously from same excited atoms in  $^{235}\text{Uranium}$  fission products in solar flare. The next paper published in September 2013 helped in understanding that each one of the solar radiations particularly beta, gamma, X-ray emissions, Bharat Radiation, EUV, UV, visible, and near infrared radiations have a specific velocity depending upon wavelength or energy [4]. Because of their specific velocities, all the solar radiations mentioned above follow one another from Sun. In the current study, beta, gamma, X-ray emissions are clubbed together in considering their energy for ease in interpretation. Interpretation of variation of temperature with height became possible mainly because distinct wavelength ranges of all solar radiations are found situated one after another in temperature charts in figs 4 & 7.

'The most Sunlight that Earth receives is not directly from Sun' claimed as the title of this paper really happens below 10 km height. When temperatures dips to sub-zero levels at a few kilometers height, say on the Mount Everest, the temperatures are maintained to be sufficiently high on surface of earth for sustenance of life on the planet. Ultimately, this paper explains that the most Sunlight that earth surface receives is produced within 5 km height by solar beta, gamma and X-rays and not directly from Sun.

## II. RESULTS AND DISCUSSION

Better understanding of the current paper requires brief on the author's important prediction of Bharat Radiation emission, previously unknown electromagnetic radiation from radioisotopes and XRF sources in 2010 and its discovery in solar spectrum reported in March 2013 [1,2]. In 2010, the author has reported experimental discovery of unexpected UV dominant optical emission from radioisotopes and XRF sources whether present in the form of salts or metals, and also explained the emission by a previously unknown atomic phenomenon, now known as Padmanabha Rao Effect [1,12-14].

Fig. 1, a reproduced from the author's paper, March 2010 shows that in the case of Rb XRF source, the three wavelength ranges of Rb X-rays, Bharat radiation (predicted) and UV dominant optical radiation would lie successfully in electromagnetic spectrum [1]. Most surprisingly, solar physicists reported measurement of three wavelength ranges lying in the same way in solar spectrum since last 60 years (fig. 1b); however faced difficulty in identification of those wavelengths [2]. The author found close similarity between Rb XRF spectrum and solar spectrum (figs 1 & 2) that led to the first and definite identification of three wavelength regions in solar spectrum as solar X-rays up to 12.87 nm, Bharat radiation from 12.87 to 31 nm, and EUV beyond 31 nm [2].

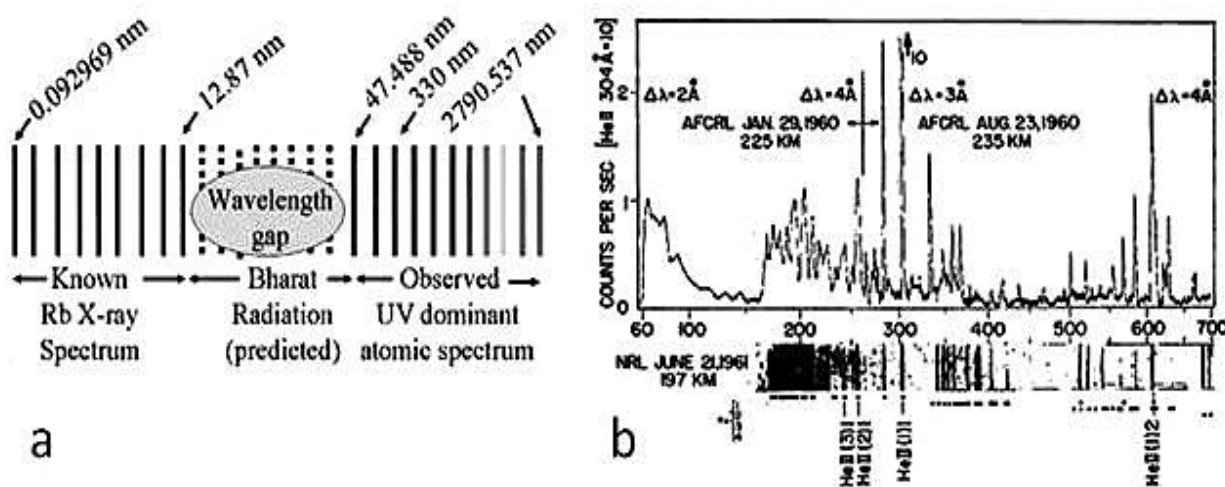


Figure 1. Reproduced is the above figure from the author's publication in March 2013 [2]. Close similarity between the three wavelength regions: Rb X-rays, Bharat Radiation and UV in Rb XRF spectrum of Rb XRF source in fig. 1a on the

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left and three similar wavelength regions in solar spectrum in fig.1b on the right measured by H. E. Hinteregger et al in 1960[15], and the three wavelength regions clearly distinguishable in fig.2 held the key in the first ever identification of three wavelength regions in solar spectrum.

Discovery of Sun's Bharat radiation emission brought a fundamental change in solar physics in the current understanding on Sunlight phenomenon from fusion to fission. It is because Bharat radiation emission originally predicted from radioisotopes found newly in solar spectrum implies definite presence of radioisotopes on Sun's core surface. That led to the 'discovery of self-sustained  $^{235}\text{Uranium}$  fission causing Sunlight by Padmanabha Rao Effect' reported in July 2013 [3]. Previously, solar physicists believed that solar X-rays, EUV, UV, visible light, and near infrared radiation emissions are independent emissions. In 2013, the author has reported that solar beta, gamma and X-ray emissions from Uranium fission fragments (radioisotopes) first cause Bharat Radiation emission from 12.87 to 31 nm, which in turn causes the Sunlight, which includes EUV, UV, visible, and near infrared radiation emissions by a previously unknown atomic phenomenon, now known as Padmanabha Rao Effect [2,3]. Solar beta, gamma and X-ray emissions are also expected to cause infrared radiation. The successful explanation of temperatures measurements with height by previous researchers in figs 4, and 7 implies that actually Sun successively emits beta, gamma and X-ray emissions, Bharat Radiation, EUV, UV, visible light, and near infrared radiation emissions, and all those solar emissions travel with specific velocities according to their wavelengths or energies.

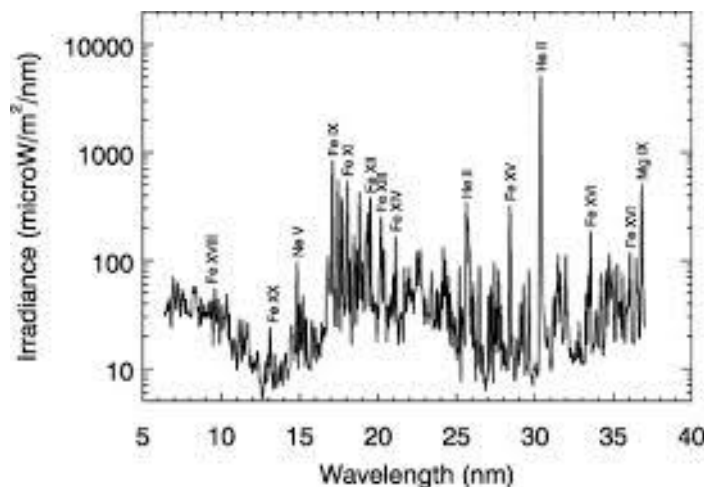


Figure 2 Solar spectrum measured by Woods et al. on May 5, 2010 reproduced here reveals close similarity between the three distinct solar wavelengths and three wavelength regions in the Rb X-ray source-spectrum shown in Fig.1. That helped the author in the first ever identification of three wavelength regions in their solar spectrum: X-rays up to 12.87 nm, Bharat radiation from 12.87 to 31 nm and EUV beyond 31 nm [2].

In September 2013, the author's reported superluminal velocities of X-rays and Bharat Radiation [4] played a pivotal role in explaining the temperatures measurements with height by previous researchers in figs 4, and 7. It confirms lower wavelengths, in other words the higher energies travel fast among solar gamma, X-ray, Bharat radiation, EUV, UV, visible, and near infrared radiation emissions.

A look at the solar spectra in Fig.3 gives a general impression that Bharat Radiation (12.87 to 31 nm) could go down just up to 119 km height above Earth because of absorption in space, while relatively more energetic X-rays could go down another 16 km further up to 103 km height. One may argue that Bharat Radiation might have started earlier, therefore Bharat Radiation arrived earlier than X-rays. However, it is not true, because both Bharat radiation and X-rays simultaneously start from solar flare, which is attributed to nuclear fallout resulted from  $^{235}\text{Uranium}$  fission [3]. In clear words, though Bharat radiation and X-ray emissions simultaneously start from solar flare, Bharat radiation with longer wavelengths travelled slowly so covered only up to 119 km height during the same interval of time in reaching satellite. In comparison, the low wavelength solar X-rays travelled fast and covered another 16 km to below 103 km height within



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the same duration of time. These findings helped in explaining the temperature measurements in figs 4 and 7. Fig.3 provides definite confirmation on solar X-rays travelling faster than Bharat radiation, what the author has demonstrated earlier from solar spectra measured by Woods et al on May 5, 2010[4].

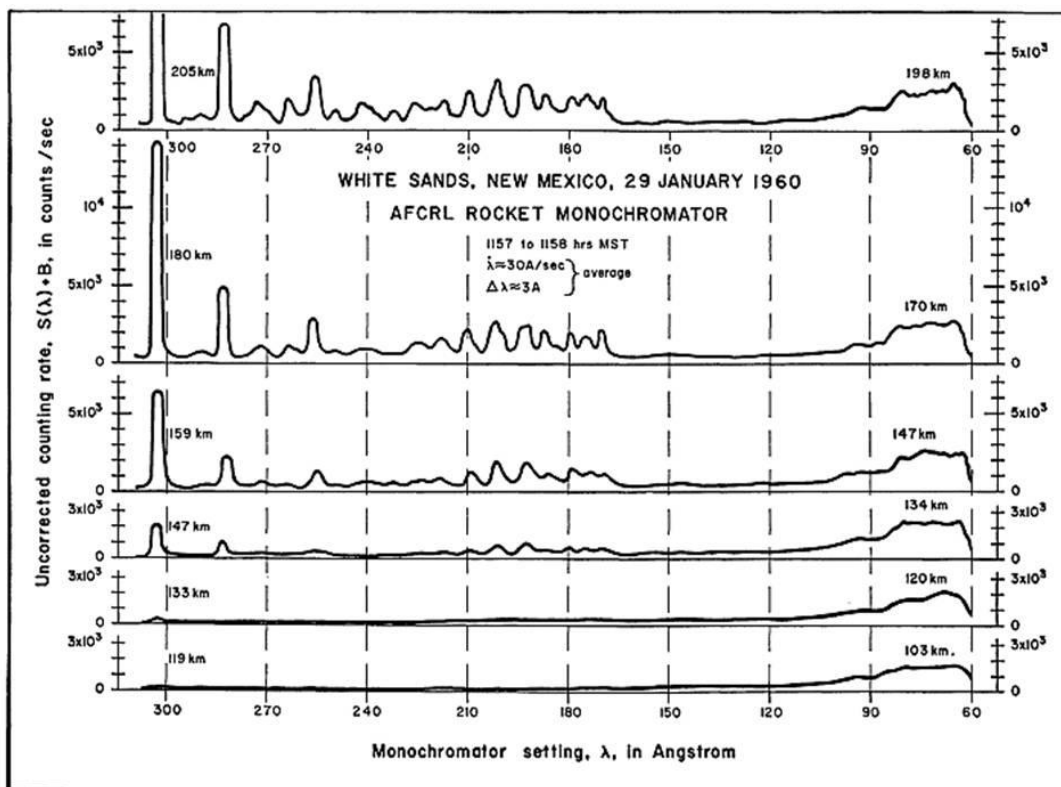


Figure 3. Solar spectra measured by Hinteregger et al. at 103, 120, 134, 147, 170 and 198 km heights over New Mexico on 29 January 1960 reproduced here reveals that the tall peaks could not be identified [2]. However, the wavelengths ended at 128.7 Å were interpreted for the first time as solar X-rays and those from 128.7 Å to 310 Å as Bharat Radiation in 2013 [2]. On the basis that long wavelengths travel slow and cover short distance [4], Bharat Radiation travelled relatively slow and went down just up to 119 km. By the time Bharat Radiation reached 119 km height, its intensity reached a minimum level. In comparison, solar X-rays with short wavelengths travelled fast and reached further down to another 16 km up to 103 km height above earth.

## EXPLANATION

If high energies really travel fast, more energetic beta, gamma and X-ray emissions among solar radiations at keV or MeV energies are expected to travel faster and cover greater distance than any other solar radiation including Bharat radiation within the same time. Figs 4 and 7 provide evidence that longer wavelengths travel slowly and cover less distance.

## Layers of the atmosphere

### I. Exosphere

It is the outermost layer of the atmosphere, extends from the top of the thermosphere to 10,000 km above the earth [8, 9].

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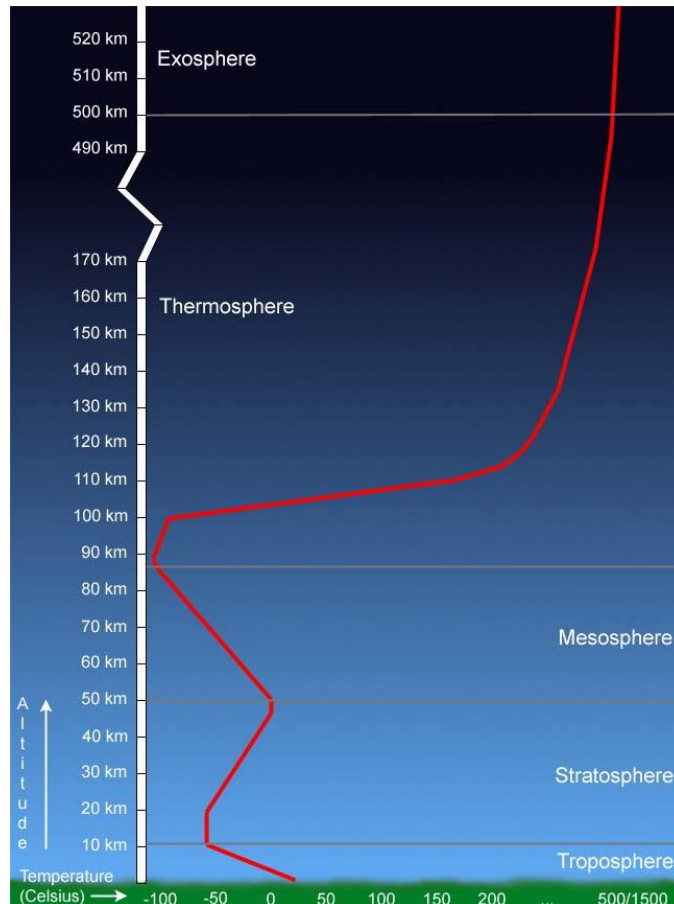


Figure 4. The 'Average Temperature Profile of Earth's Atmosphere' reproduced here is from Ref. 5

## Explanation

Among solar radiations highly energetic beta, gamma, and X-ray emissions go at fastest velocity and cover maximum distance. Then Bharat radiation, EUV, UV, visible, near infrared radiations follow one another with decreasing order of velocities. In the trail that all these radiations follow one another, near infrared radiation would be at the tail end because of its long wavelength. The high temperatures reaching around 2000° C in Exosphere at around 500 km height and above are mainly due to this dominant near infrared radiation. The question arises whether the long wavelength near infrared radiation can travel nearly 149.6 million km from the Sun. The current study reveals fission products relatively long lived radioisotopes including  $^{137}\text{Cs}$ ,  $^{90}\text{Sr}$ , and  $^{131}\text{I}$  reach below 10 km height above earth. The author postulates that beta, gamma and characteristic X-ray emissions gain more energy as they travel towards earth due to attraction by earth's gravity. When they attain energy more than 3 MeV, percent near infrared radiation in gross light intensity increases while percent UV correspondingly reduces [fig.5]. To conclude, the high temperatures in Exosphere are due to near infrared radiation partly from Sun and partly from fission products arrived from Sun.

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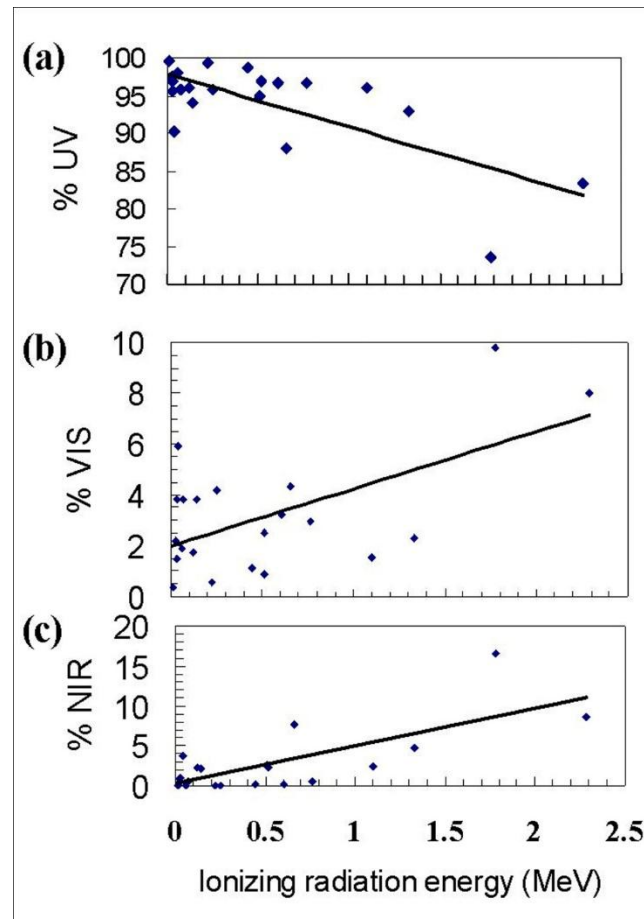


Figure 5. Reproduced here is the figure from the author's publication in March 2010 [1]. Radioisotopes and XRF sources emit an unprecedented nature of atomic spectrum with characteristic UV dominant optical radiation. Fig.5a shows UV is higher than 83% in gross light intensity, while fig.5b and fig.5c show percent visible light and near infrared radiation intensities share the rest 17%. Notably, the nature of atomic spectrum depends upon energy of beta, gamma or X-rays, but not on atomic number. Like radioisotopes, Sun also emits UV as well as Extreme UV (EUV).

## II. Thermosphere

Thermosphere, known as the upper atmosphere having a thin air is situated above the mesosphere from 690 km to 85 km height [5,8]. The density of gases present in the Thermosphere increases towards Earth, absorbs solar UV and X-rays and causes a steep temperature increase from  $-120^{\circ}$  to  $2,000^{\circ}$  C near the top of this layer [8, 9]. This happens during intense solar flare [5]. The above interpretation provided by previous researchers has a serious flaw. Instead of providing interpretation why temperatures decreased from  $2,000^{\circ}$  C to  $-120^{\circ}$  C with decrease in height, they have interpreted why temperature increased from  $-120^{\circ}$  C to  $2,000^{\circ}$  C near the top of this layer. Moreover, attributing the differences in atmospheric temperatures solely to density of gases present and their ability to absorb UV and X-rays reflects lack of clarity in explanation.

### Explanation

Fig.4 shows temperatures decreased from  $2,000^{\circ}$  C to around  $-120^{\circ}$  C in four steps in the Thermosphere. The author has successfully provided a detailed explanation why temperatures decreased at each of the four stages.

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## (i) Near infrared radiation at 500 km height

In the trail where solar near infrared, visible, UV, EUV, Bharat radiation, and X-ray, beta, gamma emissions follow each other, they all have specific velocities in increasing order as proceeded from near infrared towards gamma rays due to increase in energy (or decrease in wavelength). Therefore, near infrared radiation would be at the tail end. Furthermore, since long wavelengths travel slowly and cover short distance [4], the near infrared radiations with long wavelengths between 700 to 1,400 nm travel slowly and cover short distance. Therefore high temperatures shown in fig. 4 above 500 km height could be due to very highly intense near infrared radiation emissions produced by high beta and gamma energies from <sup>235</sup>Uranium fission products [4] but not due to absorption of UV and X-rays by gases.

## (ii) Visible radiation from 500 km to 110 km

Near infrared radiation travels very slowly and covers shortest distance resulting into fast decrease in intensity from 500 km height onwards towards earth, while visible light dominates (fig.4). In comparison to near infrared radiation, visible light can go further down probably up to 110 km towards earth because of relatively shorter wavelengths than near infrared radiation. It is to note visible light cannot change the existing temperatures in any way. The atmospheric temperature simply cools down to around 250°C from 500 km to 110 km height due to decrease in near infrared radiation.

## (ii) UV at 110 to 100 km height

When visible light intensity decreases fast around 110 km height, the dominant solar UV with shorter wavelengths might have travelled at great velocity and covered further distance up to 100 km height. In the absence of near infrared radiation, the intense UV radiation present at 110 km to 100 km height has caused a dip in temperature from around 250 °C up to around -85 °C. This interpretation raises a question how UV can reduce atmospheric temperatures to sub-zero levels. On snow peaks such as Himalayas, presence of too intense solar UV and negligible near infrared radiation intensity might be reducing atmospheric temperatures to sub-zero levels. On the other hand, low intense UV light in laboratory cannot lower the room temperature, because near infrared radiation present in the room plays a dominant role in maintaining room temperature. As happens on snow peaks, the dominant solar UV intensity has decreased temperatures steeply from 250 °C up to around -85 °C at 110 km to 100 km height.

**(iii) EUV at 100 km to 85 km height:** When most UV cannot travel beyond 100 km height, EUV radiation, with lower wavelengths remains at the tail end in the trail of solar radiations, travelled fast to reach around 84 km height. In the absence of infrared, near infrared, visible light and UV emissions, exclusively the EUV has caused the temperature to dip further to around -125°C.

## III. MESOPAUSE

### (iv) Bharat radiation at 90 to 84 km height:

Mesopause is not illustrated in Fig.4, hence more detailed graph pointing out the exact height of Mesopause is provided in Fig. 7. Similar experimental measurements of variation in temperatures with height were also investigated by M. Alpers et al in 2004 [16]. Previous explanation, if any, was not found in literature why temperature remained stationary in Mesopause.

### Explanation

While most EUV cannot reach beyond 90 km height due to its specific velocity, the Bharat radiation with lower wavelength (relatively higher energy at eV level) than UV and EUV was able to travel at higher velocity than EUV and could go down further to around 84 km height but unable to alter the atmospheric temperature in any way. Therefore the atmospheric temperature remained stationary at around -120 °C in Mesopause as shown in Fig.7.

### Ionosphere

At 80 km height, solar radiation and the high temperatures in the thermosphere ionize molecules and generate short lived electrons, which will be captured by nearby positive ions. That is how a vast Ionosphere, an extension of the thermosphere is generated full of charged particles having the properties of a gas and of a plasma [5]. The ionosphere is



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classified into the D, E and F regions based on what wavelength of solar radiation is absorbed in that region most frequent (fig.6). The D region below about 90 km absorbs hard x-rays, while the E region at about 105 km absorbs soft x-rays and the F region from around 105 km to 600 km absorbs EUV [5, 8].

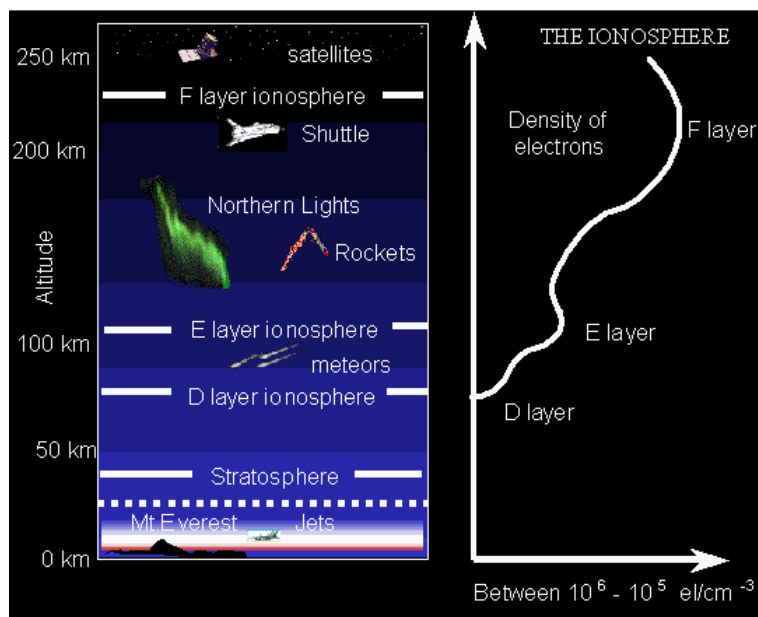


Figure 6. This is reproduced from Ref. 17. The location of the layers of the ionosphere in altitude and a sketch showing the peaks in the electron concentration that are referred to as the D, E and F layers of the ionosphere.

In the author's view, the ions in Ionosphere could be highly ionized <sup>235</sup>Uranium fission products including radioactive Krypton and Xenon gases.

Fission products remain as highly ionized state, since high flux of gamma rays knock out most core electrons and may be expected to leave the excited atom with one or two core electrons. These highly ionized excited atoms in fission products form a cloud and travel across space. Such radioactive clouds emitting gamma, beta and X-ray emissions would be present throughout the Ionosphere. The current study shows the radioactive cloud constituting some individual long lived radioactive atoms such as <sup>137</sup>Cs, and <sup>90</sup>Sr reaches earth's atmosphere even below 10 km height. That is why an open scintillation detector left without lead shield detects abundant background radiation due to gamma radiations from fission products arrived into Earth's atmosphere from Sun.

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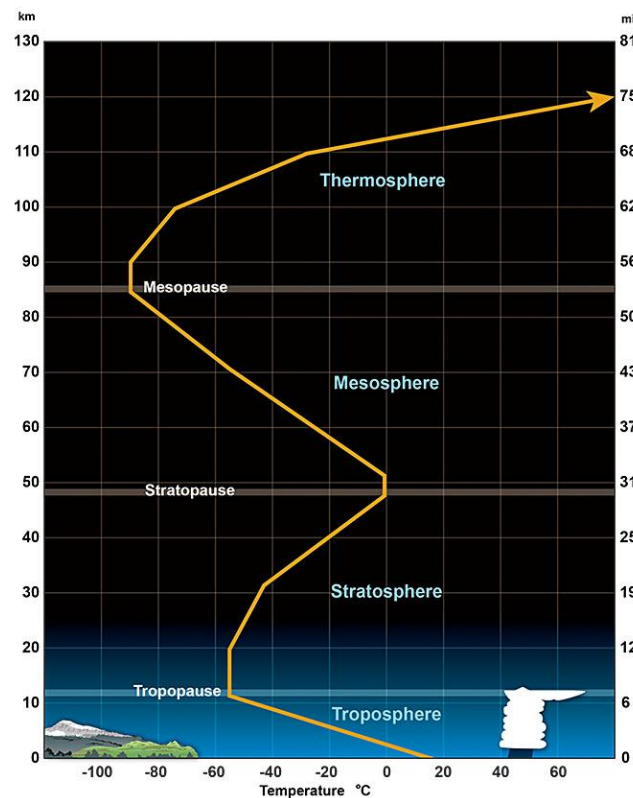


Figure 7. This graph improved further from fig.4 on temperature variation is reproduced from 'Standardized Temperature Profile, [9].

## IV. MESOSPHERE

This layer extends from around 84 to around 54km above the earth (fig.7). As proceeded towards earth, density of the gases including the oxygen molecules increases, and temperatures increase from coldest temperature of around  $-120^{\circ}\text{C}$  to about  $-15^{\circ}\text{C}$  near the bottom of this layer [5,8, 9].

### Explanation:

#### Beta, gamma and X-rays at 84 to 54 km height

The most notable finding in the current papers is that all solar electromagnetic radiations including the near infrared, visible, UV, and EUV radiations could go at the most up to around 84 km height. In clear words, no direct Sunlight from Sun below 84 km height. The rest highly energetic beta, gamma and X-ray emissions with keV or MeV energies among solar radiations play a vital role in producing Sunlight below 84 km height as explained in the following. These solar beta, gamma and X-ray emissions travel at maximum velocities and can go down to around 54 km height above Earth's surface, and interact with the atmosphere present in the Mesosphere. While X-ray, gamma and beta emissions pass through core Coulomb space of the unexcited atoms present in Mesosphere, they lose energy at eV level with the energy slightly higher than that of UV or EUV [fig.8]. The loss of energy reappears as Bharat radiation, which does valence excitation and generates Sunlight, which includes dominant EUV and UV, visible light, and near infrared radiation at 84 to 54 km height. There is a valid reason why increase in temperatures took place from  $-120^{\circ}\text{C}$  to nearly  $-15^{\circ}\text{C}$ . The author postulates that beta, gamma and X-ray emissions might have gained more energies while travelling towards Earth, due to attraction by Earth's gravity, the details of which explained later. That is why these solar

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ionizing radiation might have generated intense near infrared radiation above 17% in the gross light intensity (fig.5). The trail of solar radiations leave near infrared radiation at the tail end from 84 to 54 km height that increased temperatures from -120 °C to nearly -15°C.

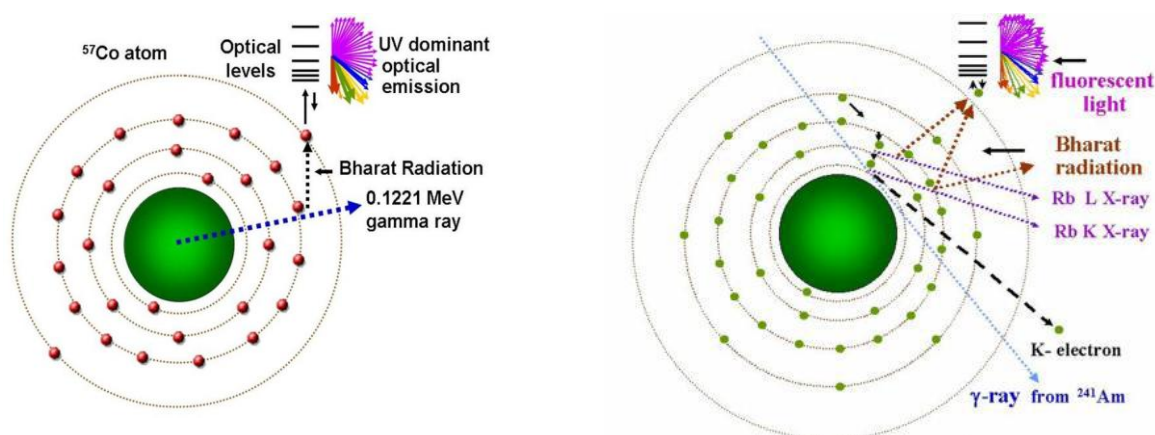


Figure 8. The figure on the left reproduced from author's paper, March 2010 explains how  $\gamma$  or  $\beta$  causes two more generation of emissions: Bharat Radiation, and UV dominant optical radiation from within the same excited atom of a radioisotope ( $^{57}\text{Co}$ ) by the previously unknown atomic phenomenon [1]. Likewise, highly intense solar  $\gamma$  and  $\beta$  emissions cause two more generation of emissions: Bharat Radiation and bright Sunlight including EUV, UV, visible, near infrared radiations from within the same excited atoms of gas present in Mesosphere. The figure on the right explains how an X-ray also generates two more generation of emissions: Bharat Radiation and UV dominant optical radiation from within the same excited atom of Rb XRF source [18]. Likewise, highly intense solar X-rays also generate two more generation of emissions: Bharat Radiation and bright Sunlight including EUV, UV, visible, near infrared radiations from within the same excited atoms of gas present in Mesosphere.

## V. STRATOPAUSE

### Visible light from 54 to 48 km height:

When near infrared radiation produced by solar beta, gamma and X-rays cannot go down beyond 54 km height due to limitations of its velocity, the visible light by virtue of further low wavelengths go down to 48 km height. However, it is unable to alter the temperature in any way from -15°C from 54 to 48 km height as shown in fig.7.

## VI. STRATOSPHERE

The Stratosphere extends to around 50 km to around 6 km holds 19 % of the atmosphere's gases and temperature increases from average -51° to about -15°C as approaches top of Stratosphere [9]. Most ozone in the Earth's atmosphere is in the stratosphere [5]. Ozone and oxygen molecules concentrated mostly at 16 and 60 km height absorb 95 to 99.9% of the Sun's UV-C and UV-B and re-emitted as heat causing increase in temperature with height [5, 8]. Two more reasons mentioned in the following were attributed why increase in temperature. In the process of the formation of Ozone with increased absorption of UV, the temperature increases from an average -51°C to -15°C [5, 8]. The presence of greenhouse gases make the atmosphere absorb more heat, known as the greenhouse effect. However, the current explanation does not agree that the increase in temperature is due to ozone.

**Total absorption of UV by ozone layer opposed:** Fig. 9 shows a thick ozone ( $\text{O}_3$ ) layer exists in the Stratosphere approximately at the height 50 km to 20 km and believed to absorb most of the Sun's UV, protects thus

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life on Earth from harmful effects, on excessive exposure to UV. The fact that UV is unable to go down below 20 km height is not due to absorption by ozone, but because of its specific velocity as explained in the following.

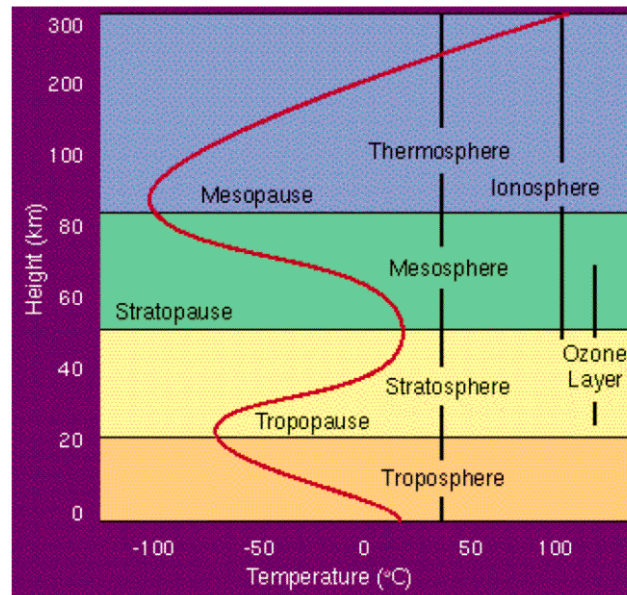


Figure 9. This picture is reproduced from the website

<http://pixshark.com/ionosphere-layers-atmosphere.htm>

## UV from 48 to 33 km height:

Fig.7 shows that by virtue of lower wavelengths than visible light, UV goes further down to around 33 km height and lowers temperatures from around 0°C to around -42 °C.

## EUV from 33 to 20 km height

In comparison to UV, the EUV with very low wavelengths travels further down to 20 km height and lowers temperatures further to around -58°C. Therefore this fall of temperature is not due to part played by ozone. On extending the results observed with radioisotopes in fig.5 to solar flare, low beta, gamma and X-ray energies of some fission products present in an intense solar flare might have caused relatively high EUV and UV intensities [table, 4]. Periodical variations in low temperatures at 20 to 48 km height depends upon how intense is the solar flare; solar beta, gamma and X-ray energies; and in turn the resulting EUV and UV intensities.

## VII. TROPOPAUSE

**Bharat Radiation from 20 to 10 km height:** The Bharat radiation with lower wavelength than UV or EUV could go down up to 10 km height, but unable to change temperature in any way from -58 °C from 20 to 10 km height (fig.7).

## VIII. TROPOSPHERE

The lower atmosphere known as Troposphere begins at the Earth's surface and extends from 20 to 6 km high, and actually its height varies from the equator to the poles [9]. As the density of the gases in this layer decrease with height, the air becomes thinner, the temperature decreases with height in response from an average around 17° to -51°C at the tropopause [8,9]. Precisely, the visible light, between 400 and 700 nm, represents 42 to 43% of the total radiant energy emitted. UV accounts for 3 to 8%. Near infrared range from 700 to 1000 nm; the thermal infrared, between 5 and 20

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microns; and the far infrared regions account to 49 - 55% of the radiant energy[19]. If these percentages are to be interpreted from fig.5, low percent solar UV, and correspondingly high percent visible light and near infrared radiation intensities could be due to solar beta, gamma and X-ray emission with energies higher than 3 MeV. These findings support the current explanation.

## Greenhouse effect

The most popular view for moderate temperatures in Troposphere is the Greenhouse effect. Increasing concentrations of greenhouse gases such as water vapor, methane and carbon dioxide in the atmosphere absorb most of the Earth's emitted infrared radiation and also restrict the outward passage of emitted radiation, resulting into increase in the temperature of the lower atmosphere known as "global warming" [19,20].

Reflection from the ground is primarily visible light with a maximum radiation peak at a wavelength of 555 nm (green light). The relatively small amount of energy radiated from the earth at an average ambient temperature of 17°C at its surface consists of infrared radiation with a peak concentration at 970 nm which are invisible to the human eye[7,11].

## Explanation:

### Beta, gamma, and X-ray emissions below 10 km height

Previously believed that density of the gases in this layer decreased with height, hence the temperature decreased with height. Instead, it is necessary to explain why the temperatures increased to around 17°C in fig.7.

Bharat radiation could reach just up to 10 km height above Earth's surface. Therefore, only the beta, gamma, and X-ray emissions remain among all solar emissions at around 10 km height. An explanation is needed how beta, gamma, and X-ray emissions cause temperature increase from -58°C to normal temperatures around 17 °C below 10 km height on the surface of the Earth.

### Previously unknown gravitational force of radiation

The author postulates existence of gravitational force of electromagnetic radiation such as gamma ray, X-ray, and light photons, and particulate matter including electrons and protons.

The author explained why gamma and beta emissions acquire more and more high energies while approaching towards Earth. It is because of the fact that both electromagnetic radiation and particulate matter will have gravitational force towards the direction of motion (Z axis), when the other two electrical and magnetic components are in X and Y axes. Earth's gravitation field links with the gravitation field of the said radiation and pulls towards Earth and more towards North and South poles. As a result, these radiations acquire more and more high energies as they approach Earth.

From 10 km height, Sun's gamma, beta and X-ray emissions gain more energy due to attraction by Earth's gravity so as to be above 3.0 MeV as explained in fig.5, causing high intensities of visible light and near infrared radiation (above 17%) so that the temperatures on Earth's surface raise suitably to around 17% for sustenance of life. High flux of Sun's gamma, beta and X-ray emissions generate bright Sunlight within 5 km height approximately above Earth.

Sudden surge of electron beam passing from clouds to earth and creating a lightening in the sky and on the ground is the most common experience in rainy season. Probably, the lightening could be fluorescent light emission produced by electrons in large pool of ions present in clouds by the phenomenon shown in fig.8. The same way, high flux of Sun's gamma, beta and X-ray emissions generate bright Sunlight when interact with gaseous atoms in atmosphere present within 5 km height above the earth.

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