Reducing of the Radiations from Interplanetary Space

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ABSTRACT

Radiation consists of the set of the electromagnetic waves which are emitted from the particulate matter of the space as we can say which involves the ionisation of the particles of the high energy. Thus, in the outside of the earth atmosphere there are cocoon of the radiations which come and hit the earth surface.it is the form of the energy that is emitted in the ray's electromagnetic waves or the particles. This form of the radiation can sometimes be seen as the visible light or even the ultraviolent light.my research is towards the reducing of the harmful radiations from interstellar space.

Keywords : Solar Sails, Dacron Coated Poly Crystalline Fibre.

I. INTRODUCTION

Radiation as we can say it is the form of the matter which is traveling through the space. Sunshine is the one of the most ionising radiations as we can say. Thus, it delivers light in the form of packets of the light photons to the earth atmosphere. But I am concerned toward the harmful effects of the space radiations and its recovery. Space radiation as we can say is comprised of the electrons which are taken away and only the nucleus remains. Thus, the radiations are of the three kinds of the radiations. One we can say the trapped particles and the other particles which are shot over the space and the other the galactic cosmic rays which are ionising radiation in the earth atmosphere. The space radiation can become if more of the ionising radiations reaches the earth atmosphere and it creates the harmful effects on all of the living beings in the earth. Beyond the earth low orbit thus space radiations pose the serious threat to the astronauts and it may sometimes lead to cancer. Some of the research are shown that the most of the serious risks comes from the galactic cosmic rays which comes from the third ways of the radiation as

discussed. Thus, it is possible to reduce some of the ionising radiation of the galactic cosmic rays and we can reduce the effect on the astronauts. Ionising radiations consists of the alpha beta and gamma rays as we can say leads to the most ways of the emitting radiations to the earth atmosphere. Out of these thus the gamma is the most powerful and the dangerous radiations reaching to the earth atmosphere. These radiations also contribute to the effect on the human beings and the space stations in the outer space.
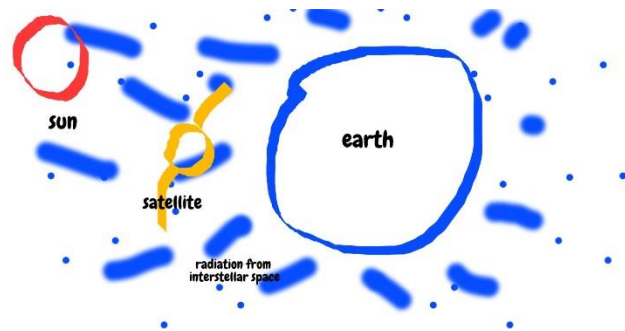

Figure 1 : radiation to earth from the interstellar space

II. METHODS AND MATERIAL

ORIGIN OF THE RADIATIONS

Radiations can arise from the different forms and the sources can be of the various kinds. Basically, the

radiations are mostly created by the humans. The radiations which are produced by the humans include the radiations from the x-rays, mobile phones and some sorts of the medical applications. Because of these thus the astronauts are experienced to the severe forms of the effective ionising galactic cosmic waves radiations.
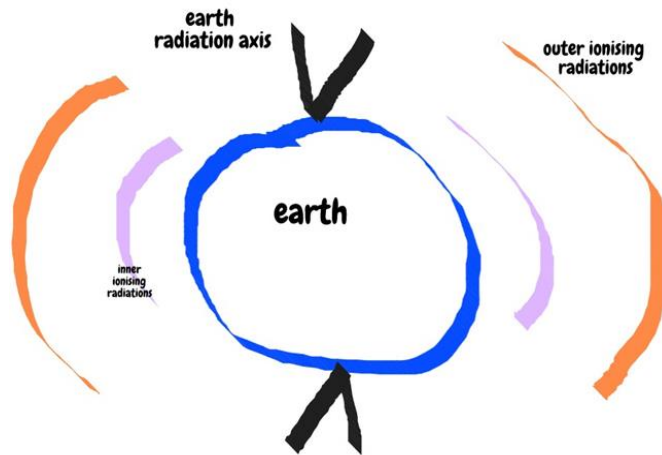

Figure 2: inner and the outer radiations belt from the earth surface

IONISING RADIATIONS

Ionising radiations are the which carries the enough energy to expel the electron out of them by ionising the electrons. Some of the examples of the ionising radiations as we can say are gamma rays and the electromagnetic wave particles. Thus, the ionising radiations are not detectable by the human sense and also, we have separate type of the instruments fort detecting of the ionising radiation's reaching the earth atmosphere.one of the serious effect of the ionising radiation is that thus the radiation can penetrate and alter their properties and causes more defect to the objects in the matter.
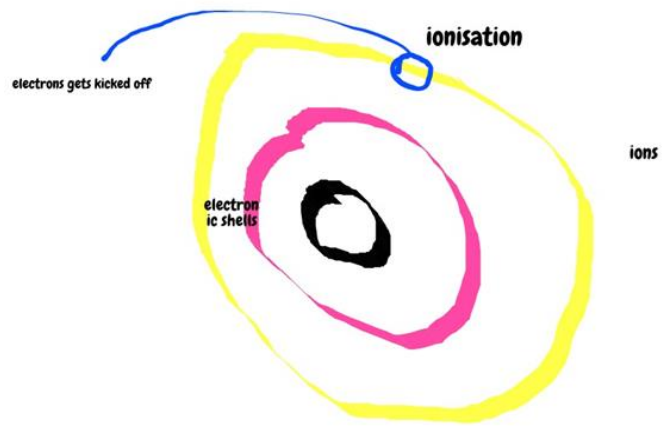

Figure 3: ionising radiations with the electrons

NON-IONISING RADIATIONS

Non ionising radiations are the one which does not carry any of the energy and the completely remove the atoms from the nucleus. Some of the examples of the non-ionising radiations are the visible light, infrared, microwave and low radio frequency waves. Thus, the non-ionising radiations does not penetrate and it does have much more effect when compared to that of the ionising radiations.

COSMIC RAYS

Cosmic rays are one of the most powerful radiations when compared to that of the ionising and non-ionising radiations. Thus, the origin of the cosmic rays come from the outside of the solar system. Here are the one which we are focused, because the cosmic rays pose the much of the harmful radiations to the astronauts and the outer space. They are composed of the mainly of the high energy proton and nuclei. Data from the fermi telescope have exploited that the major contribution to the cosmic rays comes from the supernovae explosions of the stars.

COMPOSITION OF COSMIC RAYS
Cosmic rays which are emitted mostly consists of the well-developed nuclei atoms. Thus, the emission of the cosmic rays consists of the protons and the helium

particles. It also consists some of the small amount of the particles such as the positrons.

ENERGY

Energy as well known is considered to be the major facto in any kind of the radiations emitting from the earth atmosphere as well as from the interstellar space. On concerning with the cosmic rays, thus the cosmic rays have the greatest attracting properties, due to the effects they cause in the microelectronics. The cosmic rays emit the much dangerous radiation because it consists of mostly of the high energy cosmic rays which have produces the greatest amount of the electromagnetic waves. Although most of the cosmic rays does not emits much of the harmful radiations some of the cosmic rays still exits in the outer atmosphere.

$$\gamma \equiv \frac{c}{\sqrt{c^2 - v^2}} = \frac{1}{\sqrt{1 - \beta^2}} = \frac{dt}{d\tau}$$

and

$$\beta = \frac{v}{c}$$

The above equation shows the energy calculations of the cosmic rays, with the help of the Lorentz force equation.

$$\gamma = \frac{E}{m} \quad \text{or} \quad \gamma = 1 + \frac{k}{m} \quad \text{and b is}$$

then

$$\beta = \sqrt{1 - \frac{1}{\gamma^2}}$$

if the proton is assumed some form of the kinetic energy with the emission of the alpha and the beta rays then the following equations can be substituted to find out the energy emitted from the body.
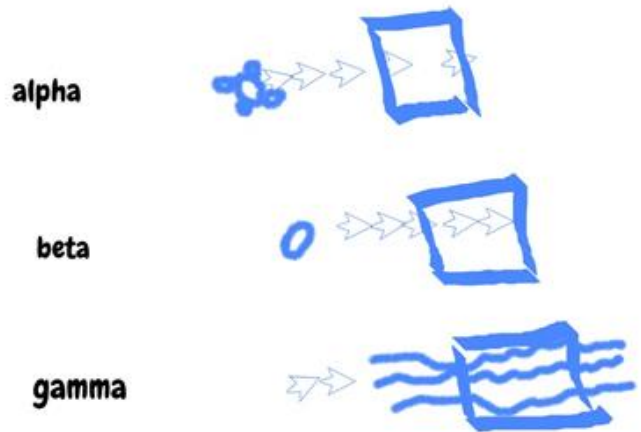

Figure 4: types of the radiations

REDUCING THE HARMFUL RADIATIONS

By the proper utilising and the shielding of the material it is possible to reduce the radiations and control the harmful effects of the radiations. Some of the ways we can utilise the material are the polymer and the other types of the polycrystalline and the amorphous materials. The polymer consists of the woven fabric which is placed in between the material and it helps in the increase the properties of the material. The nanoparticles are almost used in the reducing of the harmful radiations in my research. These are the tiny particles which utilises the most of the bond attached to them and enhances the property of the material which are provided to them.

SOLAR SAILS

Solar sails are the one which consists of the large array of the panels which are arranged together to absorb the particles of the photons which are emitted from the sun. particularly I am focusing of the solar sails because it entails the maximum amount of the are which can be utilised in reducing the harmful radiations from the interstellar space.
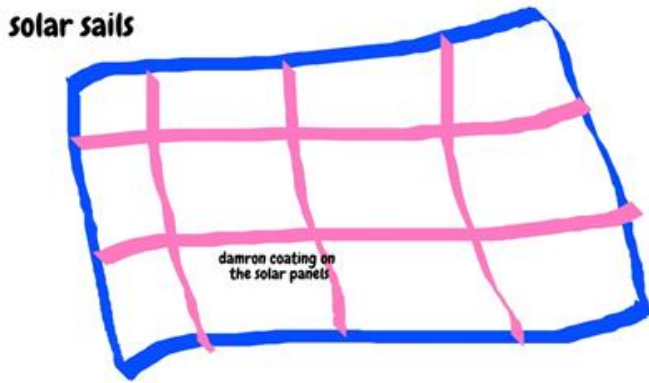
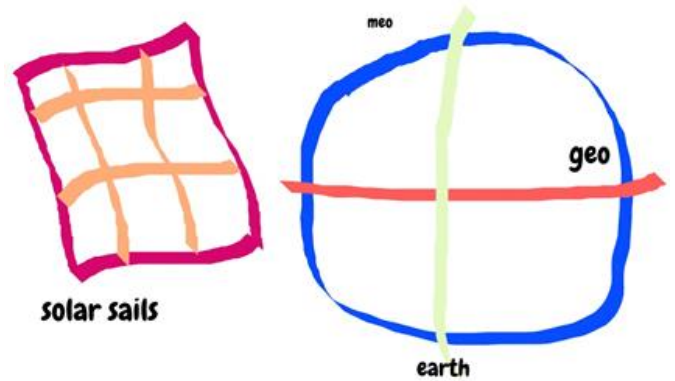Figure 5: solar sails entailed with coated damron polycrystalline fibre

Figure 6 : placing of the solar sails to reduce harmful radiations

$F = 2RSA/c \sin 2\theta$

The above formula shows the panel calculation area to absorb the harmful radiations

Where

F-thrust

r-fraction of the incident light

d-distance from the sun

s-solar flux in w/meter square

a-area of the sail in meter square

θ-required tilt angle

DEMRON COATED POLYCRYSTALLINE FIBRE

demron belong to one of the categories of the polycrystalline fibre which has the high strength in the fabric woven around them. The strength to weight ratio of the demron fibre is high and thus we are making the solar panels with the coating of the demron coated polycrystalline fibre. Solar sails as discussed is collated with the polycrystalline fibre of the demron coating. Thus, the number of the panels required is calculated with the following formula.

PROTECTION FROM THE HARMFUL RADIATIONS AS MUCH AS CONCERNED

It is flexible Metal embedded with the polyethylene-based material

Radiation shielding calculation

$\emptyset = nA/4pi\ r\ (2)$

The above equation can be used for the calculation of the radiation shield effect from the space. Gamma rays are emitted which are the galactic cosmic rays as my research is concerned. This equation is made for the calculation of the amount of the gamma rays which are emitted from the interstellar space above. The absorber coefficient can be reduced or increased depending upon the utilisation of the material of the polycrystalline fibre woven around the solar panels. Based on the results obtained from the calculations it is possible to determine the shielding effect coefficient with the respect to the solar panels.

III. RESULTS AND DISCUSSIONS

Radiation within the couple of the years tend to be much more harmful to the human beings and the interstellar space if not properly articulated. Thus, by utilising the high shielding damron polycrystalline fibre it is possible to reduce the harmful effects of the radiation. The damron fibre is tested and it produced the following results as done with the analytical calculations.

I am much more focused on this fibre because as far as concerned toady in the world this this only available

matrix fibre which can be also encapsulated with the solar sails equipped with the carbon nanotechnology. Thus, by combining of both of the materials it is possible to make even more resistance in the shield and ability to resist to the radiation as much as possible.

IV. CONCLUSION

The damron fibre with the carbon nanotubes is tested and compared with the analytical formulas and it produced the matching results.

V. ACKNOWLEDGEMENT

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