

Rate of losing energy in Quantum Redshift

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Rate of losing energy in Quantum Redshift

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Abstract

The paper simulates the losing energy of the electromagnetic waves in a non-expansion space and no gravitational Redshift. We use the distance and Redshift of 93,060 nearby space objects, including stars, quasars, white dwarfs, and carbon stars, for obtaining the rate of losing the energy of their waves during traveling in space. Quantum Redshift disagrees expansion of space and describes Redshift by losing the energy of electromagnetic waves over time. In the Quantum Redshift, regardless of the material and type of the space objects (stars, quasars, white dwarfs, and carbon stars), the Redshift depends on the distance and temperature of the space objects, and the temperature of space. We have used SIMBAD Astronomical Database. We have retrieved this information from almost 2,200,000 records. The objects' temperature is between 671 and 99,575 K. The distance of the objects is between 413.13 and 0.5 (mas). The paper obtains the average rate of losing the waves' energy for different objects in different distances. The results show that by increasing the distance of space objects, the rate of losing the energy of their electromagnetic waves will be decreased. The paper inspires investigating the expansion space theory by the Quantum Redshift.

Introduction

Quantum Redshift [1] is a new theory for describing the shift in spectral lines of electromagnetic waves. In the Quantum Redshift, each period of the electromagnetic waves is like a virtual box, and each period includes 8.9875518173474223E + 16 quantum energy [2]. In the Quantum Redshift, regardless of the frequency of the waves, each virtual box (k box) loses a little energy during traveling in space (Redshift) or even obtain energy (Blueshift) depends on the environmental parameters such as the temperature of space [3]. Hence, the emitter's temperature, space's temperature, and the movement path of the waves are basic parameters for calculating the Redshift. In the Quantum Redshift, the effect of temperature of the emitter, temperature of space, and other unknown parameters are denoted by parameter p.

In the Quantum Redshift, the p parameter is an important parameter, and its value is the amount of the lost energy of each period of the electromagnetic waves in each second. The relationship between the frequency of the emitter and observer given by:

$$f_{obs} = f_{emit} \left(1 - \frac{p}{q}\right)^t \quad (1)$$

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where f_{emit} is the frequency of the emitter, f_{obs} is the frequency that the observer receive, q is a constant value and is the capacity of each period of the electromagnetic waves which is equal to 8.9875518173474223E + 16, t is time distance between emitter and observer, and p is the amount of losing energy in each second.

According to the definition of the Redshift

$$z = \frac{f_{emit} - f_{obs}}{f_{obs}} \quad (2)$$

hence,

$$\frac{f_{obs}}{f_{emit}} = \frac{1}{z+1} \quad (3)$$

using (1),

$$z + 1 = \frac{1}{\left(1 - \frac{p}{q}\right)^t} \quad (4)$$

on the other hand,

$$d = t * c$$

where d is the distance between emitter and observer, and c is the speed of light.

Hence,

$$d = c * \log_{\left(1 - \frac{p}{q}\right)} \left(\frac{f_{obs}}{f_{emit}} \right) \quad (5)$$

In the Quantum Redshift, relationship between the distance and equivalent blackbody temperature of the emitter and observer is given by:

$$d = c * \log_{\beta}^{\frac{T_{obs}}{T_{emit}}} \quad (6)$$

where T_{obs} is the equivalent temperature of the spectrum of the blackbody of the observer, T_{emit} is the equivalent temperature of the spectrum of the blackbody of the emitter, and $\beta = \left(1 - \frac{p}{q}\right)$.

If we choose $T_{cmb} = 2.72548$ [4-6], we will obtain the total distance that spectrum of the emitter will be converted to the spectrum of the cosmic microwave background (CMB) [7-9].

$$d_{cmb} = c * \log_{\beta}^{\frac{T_{cmb}}{T_{emit}}} \quad (7)$$

where $T_{cmb} = 2.72548$ K.

Fig.1 illustrates the spectrum of the CMB and calculated spectrum in the Quantum Redshift.

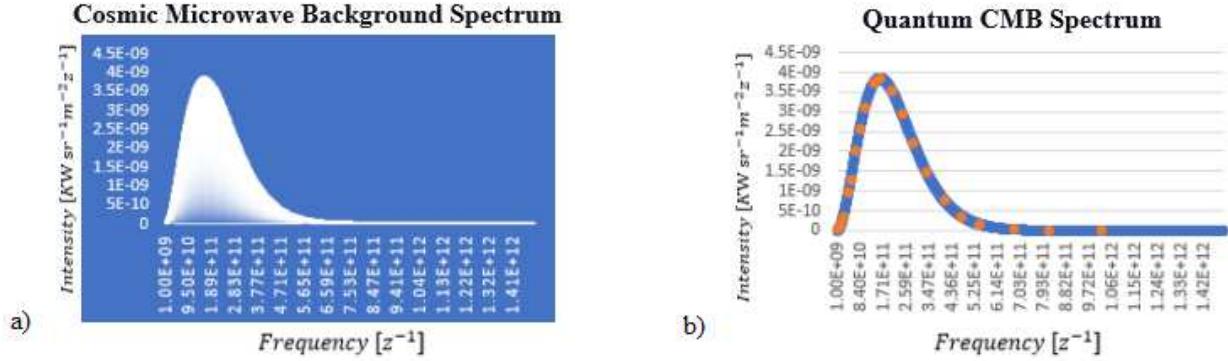


Fig.1: Spectrum of the CMB. Fig.1.a is the spectrum of the CMB according to the Planck law. Fig.1.b is the spectrum of the Quantum CMB (Red points) on the spectrum of the observed CMB (Blue line). The error is almost zero.

In this paper, we try to find the value of the parameter p by using the equation (5). The parameters c and q are constant values. For obtaining the value of the p we need to have the value of the f_{obs} , f_{emit} , or obtaining $\frac{f_{obs}}{f_{emit}}$ according to the value of the z. We have used the SIMBAD Astronomical Database and obtained the value of the parameter d. The SIMBAD Astronomical Database uses the parallax method, which is the most accurate method.

To conclude, we have used parameters z and d of the 93,060 space objects for obtaining the value of the p in the equation (5).

Rate of losing energy of different space objects

For each space object with the specific distance and Redshift, we can retrieve its p parameter or average rate of losing energy. Using (3) and (5), the equation is given by:

$$p = \left(1 - \left(\frac{1}{z+1} \right)^{\frac{c}{d}} \right) * q \quad (8)$$

where $q = 8.9875518173474223E + 16$ and $c = 299,792,458 \frac{m}{s}$.

or

$$p = \left(1 - \left(\frac{1}{z+1} \right)^{\frac{1}{t}} \right) * q \quad (9)$$

where t is the time distance between emitter and observer.

Equation (8) provides a direct relationship between the distance and Redshift of any space objects and its average rate of losing energy. Equation (8) shows that by increasing the distance, the value of the parameter p will be decreased. This implies that the rate of losing energy is not a constant value. The electromagnetic waves of the emitter lose more energy at the beginning of their travel in space. Equation (8) shows that the value of the p for space objects with higher Redshift is much more than space objects with low Redshift in the same distance.

We expect nearby space objects have Redshift near zero, but in the SIMBAD Astronomical Database, there are at least 200 objects with high Redshift. Hence, if we investigate all space objects and calculate their rate of losing energy in one category, we encounter some problems for showing them in one graph. Fig.1 illustrates the calculated values of the parameter p for all 93,060 space objects altogether. High Redshift objects including quasars, white dwarfs, and carbon stars lose more than 100,000 to 25000000 quantum of energy per second, while the average loss rate of quantum energy of the stars is less than 2000. Hence, we cannot see the distribution of the value of the parameter p for nearby on one graph, because the value of the p for stars will be shown on a line on the X-axis. For addressing this problem, we divided input data into two individual categories. The first category contains all objects with Redshift greater than 10^{-3} and The second category contains objects with Redshift less than 10^{-3} .

The average rate of losing energy in different distances for electromagnetic waves of quasars, white dwarfs, and carbon stars

Fig.2 illustrates the distribution of the parameter p for quasars, white dwarfs, and carbon stars. Regardless of the type of the high Redshift objects, by increasing the distance of the object, their losing energy per second will be decreased dramatically. Object waves in near distances lose too much energy. In distances, less than 300 light-years the value of the parameter p is more than 5,000,000 up to 25,000,000. By increasing the distance of the object to more than 2,000 light-years, the value of the parameter p will be decreased to less than 10,000. The fluctuation of the value of the p is because of the impact of the Doppler effect on the Redshift of the objects, and different temperatures of the objects.

Regardless of the fluctuation in the p value, by increasing the distance of the quasars and white dwarfs, the value of the p will be decreased dramatically. This implies that electromagnetic waves of the quasars and white dwarfs lose less energy in the long distances.

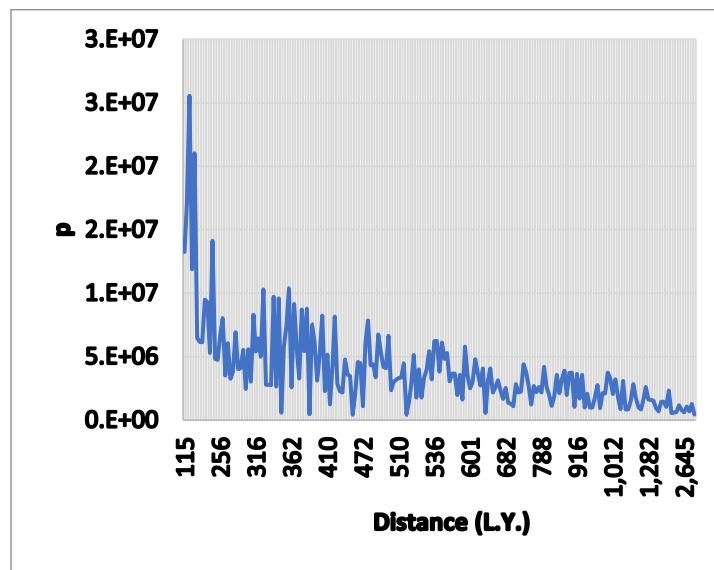


Fig.2: Decreasing the value of parameter p for quasars, white dwarfs, and carbon stars in faraway distances.

The average rate of losing energy of stars' electromagnetic waves in different distances

The second category contains about 88,000 stars with Redshift less than 10^{-3} . According to their distance, we have divided them into several subcategories. Each subcategory contains all stars in 100 million light-years. Fig.3 illustrates changes of the parameter p, by increasing the distances of the stars that shown in table.1. Fig.4 is a line graph of the table.1.

Table.1 shows the 26 rows of data. Each row contains information of all stars in each subcategory. Column (1) is distance limits. Column (2) is the average of the distance limits in each subcategory in column (1). Column (3) is the average value of the parameter p for all stars in the subcategory. Using the average of the p help to ignore the effect of the Doppler effect and temperature of the stars.

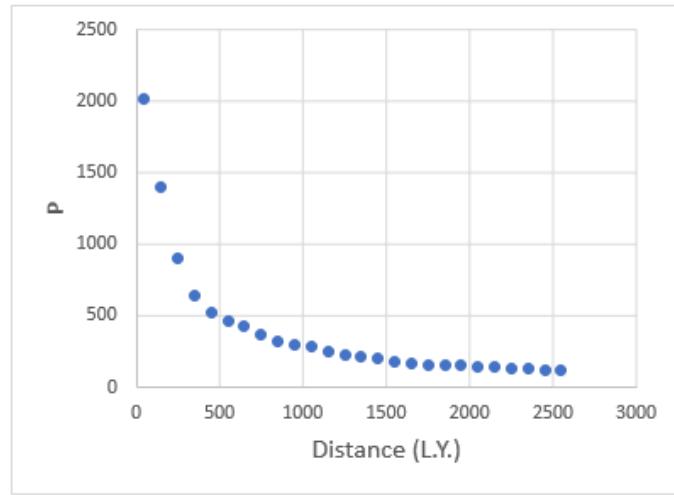


Fig.3: Decreasing the value of the parameter p by increasing the distance of stars.

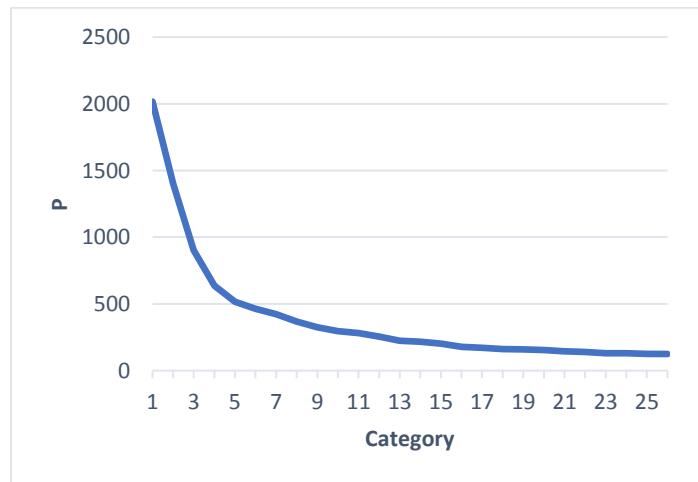


Fig.4: Line graph of the table.1.

Table.1: The average value of the parameter p in different distances

Distance (L.Y.)	Average Distance (L.Y.)	Average p
0-100	50	2016.293
100.01-200	150	1402.211
200.01-300	250	901.751
300.01-400	350	636.7403
400.01-500	450	516.8924
500.01-600	550	464.6442
600.01-700	650	422.9659
700.01-800	750	367.287
800.01-900	850	324.0687
900.01-1000	950	295.7383
1000.01-1100	1050	282.2697
1100.01-1200	1150	254.145
1200.01-1300	1250	222.6586
1300.01-1400	1350	216.0746
1400.01-1500	1450	202.5491
1500.01-1600	1550	177.9716
1600.01-1700	1650	170.7532
1700.01-1800	1750	160.4072
1800.01-1900	1850	159.9179
1900.01-2000	1950	154.8306
2000.01-2100	2050	144.7327
2100.01-2200	2150	139.3652
2200.01-300	2250	129.9134
2300.01-2400	2350	129.1667
2400.01-2500	2450	124.6599
2500.01-2600	2550	124.6311

In the column (3), by increasing the distance of the stars the average value of the parameter p will be decreased like the quasars and white dwarfs. In the Quantum Redshift, the losing energy will be continued until the spectrum of the emitter convert s to the spectrum of the cosmic microwave background.

Simulating of losing the energy in the traveling the electromagnetic waves in space

Now, we can use the data of column (3) in the table.1, for simulating the average losing quantum energy from the electromagnetic waves during their traveling in space. After emitting the electromagnetic waves from the stars, they lose about 2016 quantum energy per second in the first 50 million light-years. Losing quantum energy will be continued gradually until the spectrum of the emitter converts to the spectrum of the cosmic Microwave Background (CMB). After converting to the CMB the losing energy will be stopped.

Losing energy of the electromagnetic waves of the space objects like quasars and white dwarfs with higher temperatures are much more than stars. Hence, we could expect that they lose more energy at an equal distance and convert to the CMB faster. The light of quasars and white dwarfs cannot travel an equal distance to the stars.

Acknowledgment

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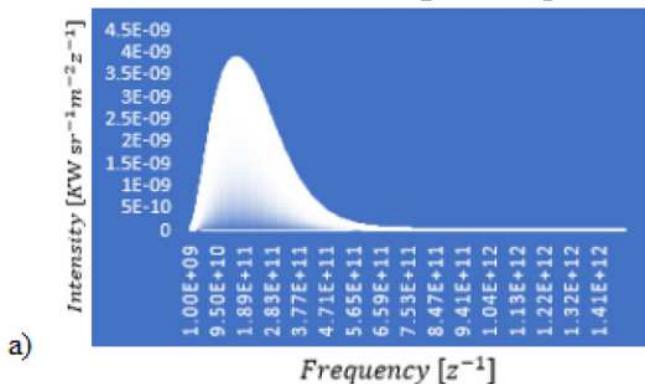
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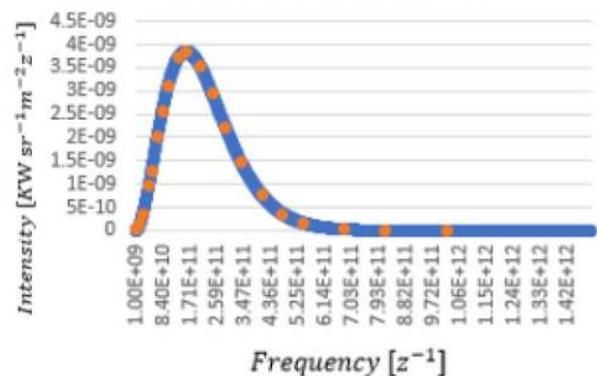
Figures

Cosmic Microwave Background Spectrum



a)

Quantum CMB Spectrum



b)

Figure 1

Spectrum of the CMB. a is the spectrum of the CMB according to the Planck law. b is the spectrum of the Quantum CMB (Red points) on the spectrum of the observed CMB (Blue line). The error is almost zero.

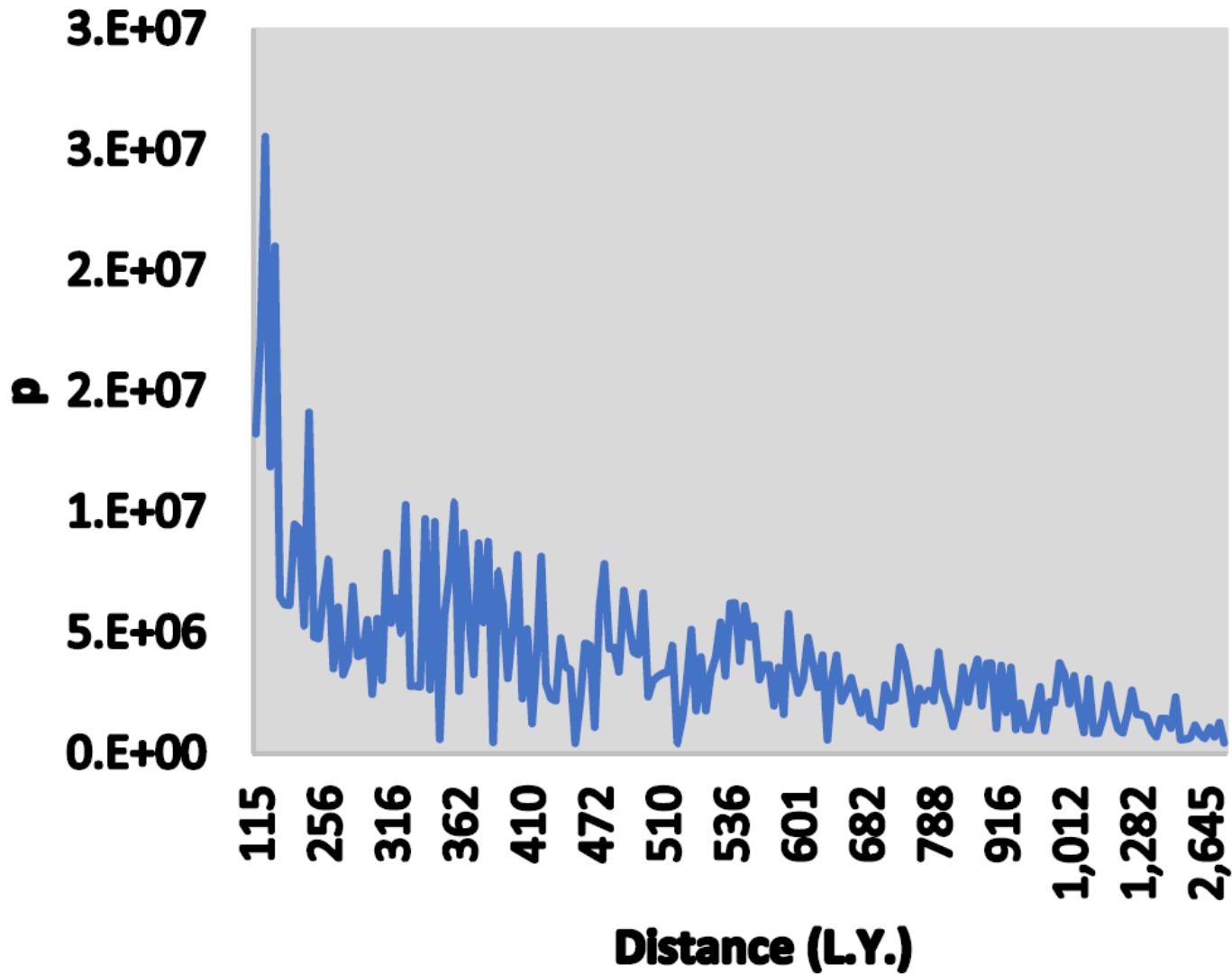


Figure 2

Decreasing the value of parameter p for quasars, white dwarfs, and carbon stars in faraway distances.

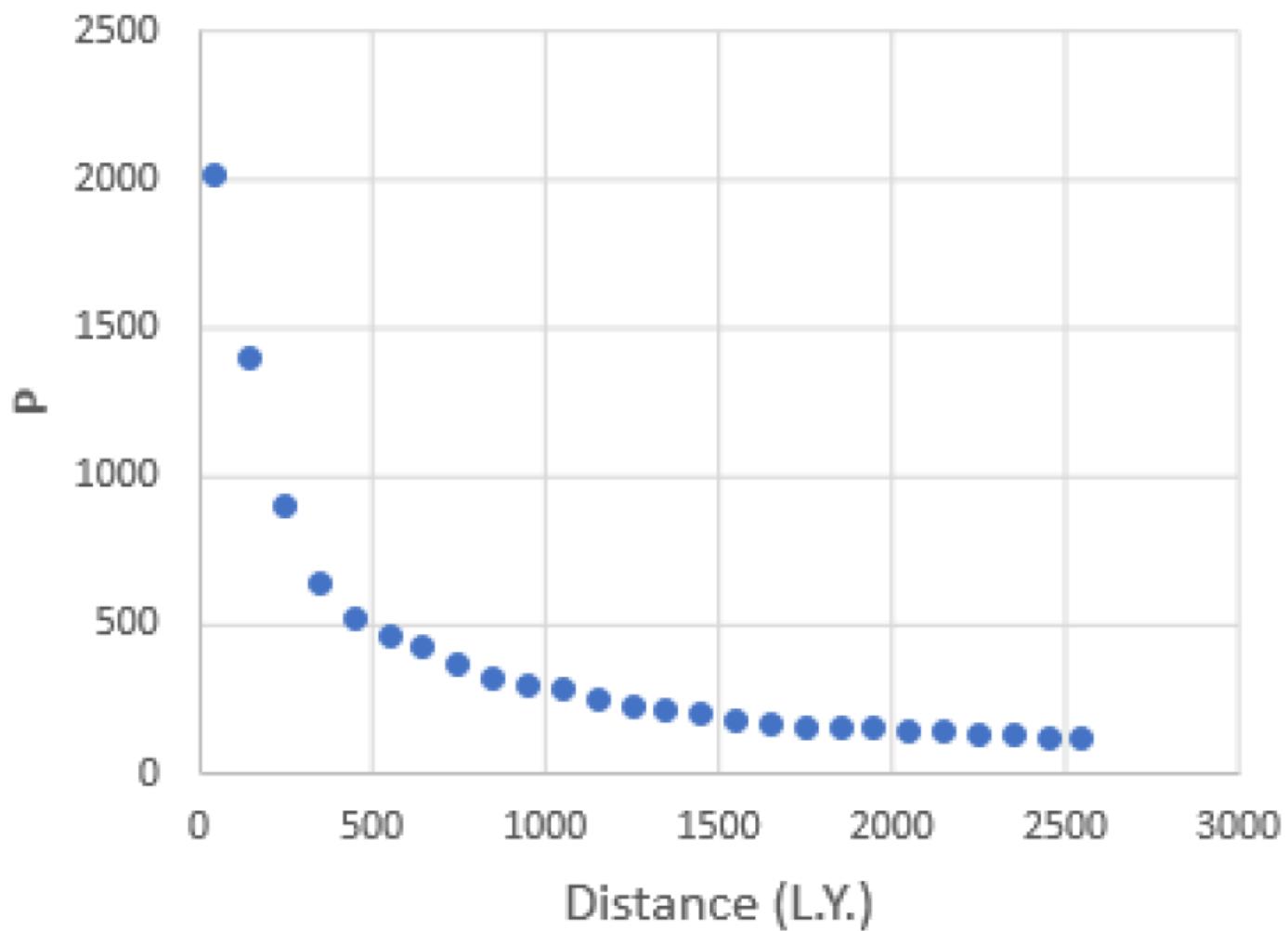


Figure 3

Decreasing the value of the parameter p by increasing the distance of stars.

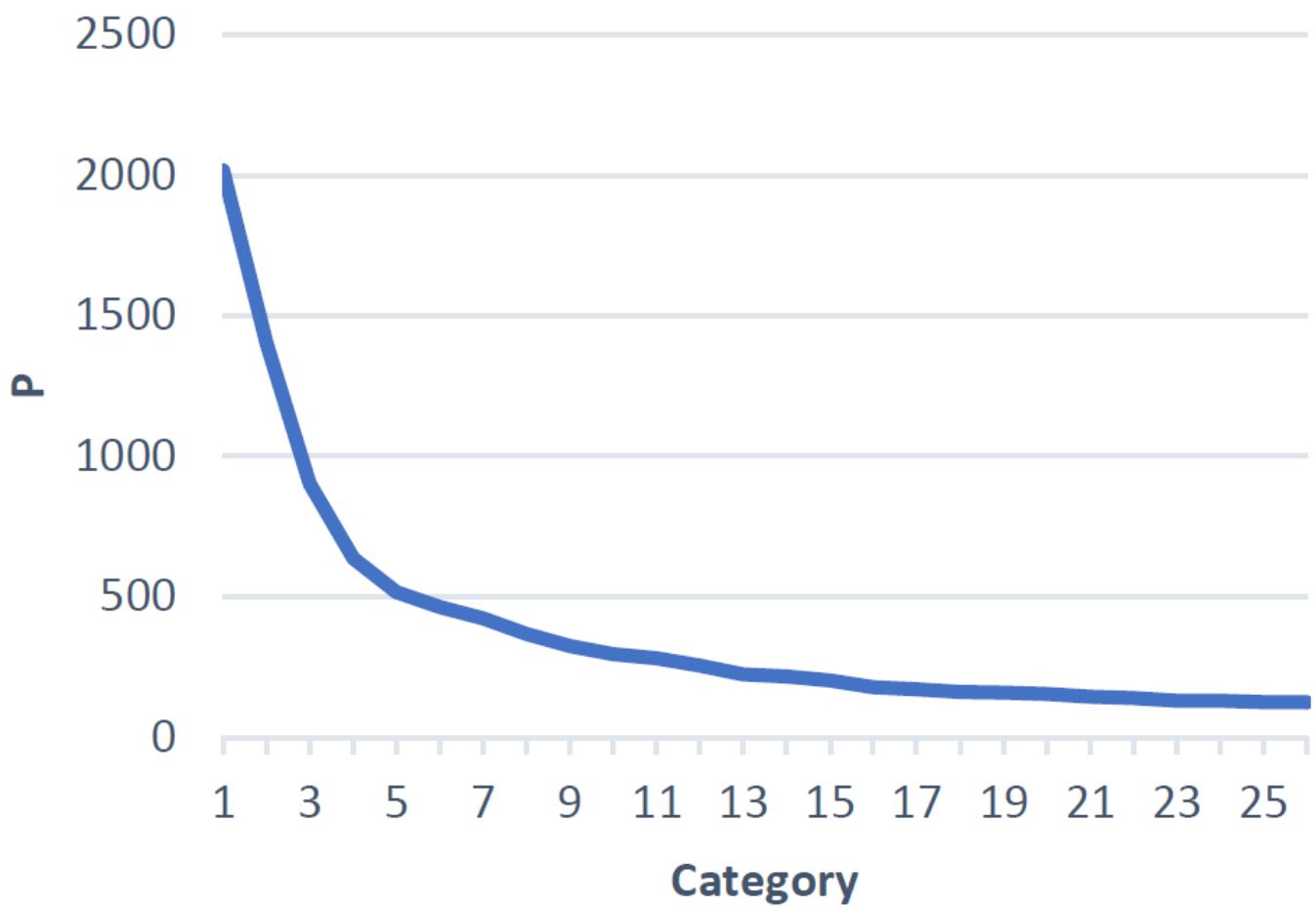


Figure 4

Line graph of the table.1.