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Detection of Natural Radiation (Background Rays)

Objectives:

To detect natural radiation and calculate the amount of background rays.

Theory:

When the Geiger counter is turned on and given the appropriate operating voltage, it starts counting without a source and the reason is the radiation emitted from the universe and from the earth. Therefore, when recording a reading from a source, the natural rays are added to the reading, so we must correct the reading by subtracting the natural rays.

The term Standard Deviation is used S.D. (σ) to express the extent of the change in reading, N= 100, $\sigma = \sqrt{N_{av}}$ which means 100 =±10

And there is the Fraction Standard Deviation (F.S.D.), which represents the amount of error in the reading

$$\text{F.S.D.} = \frac{\sigma}{N} \times 100\%$$

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practical part:

1- We install the meter on the operating voltage.

2- We set the time to 10 seconds and then fill in the table.

3- Through the table we get one value for N_{av}, σ and F.S.D.

4- We draw between N and σ also draw between N and F.S.D.

5-

Direction	N1	N2	N_{av}	$\sigma = \sqrt{N_{av}}$	F.S.D. = $\frac{\sigma}{N} \times 100\%$
Up	51	44			
Down	40	42			
Right	42	37			
Left	31	46			
Front	60	63			
Back	63	41			
			$(N_{av})av$	$(\sigma)av$	

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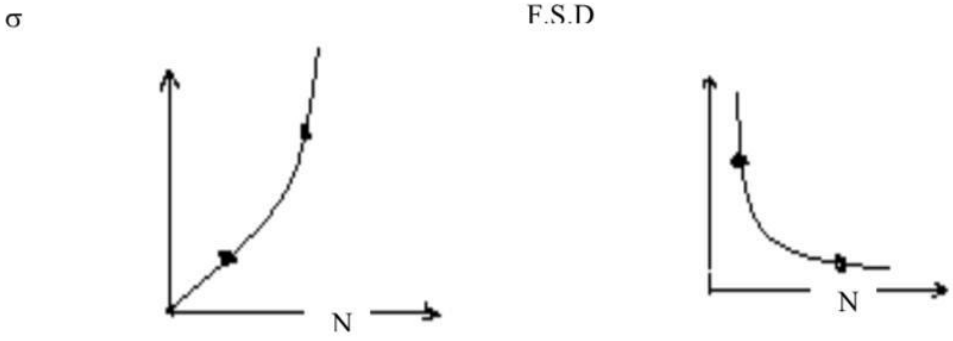

This corresponds to the theoretical with the practical, as it is proven to us that by increasing the count, the standard deviation increases and the error rate decreases.