Beamer Example

Beamer for Slideshow and Printable Notes

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April 24, 2011

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1 Concepts

1.1 Energy

Energy

What is Energy?

It is the ability to do work.

Types of Energy (not an exhaustive list)

- gravitational potential energy (GPE)
- kinetic energy (KE) and rotational kinetic energy (RKE)
- spring potential energy (SPE)
- electrical potential energy (EPE)
- thermal energy (random motion) (Th)
- sound energy (S)
- chemical energy (binding energy between atoms)
- nuclear energy (binding energy between nucleons)
- mass energy ($E = mc^2$)

1.2 Work

Work

What is Work?

It is the movement of energy from one place to another or the transformation of energy from one form to another.

Calculating Work

For*constant* force:

$$W = \vec{F}_{\|}\vec{s} = F_{parallel}s = Fs\cos(\theta) \quad (1)$$

2 Light Ex

List of Light Examples

Contents

2.1 Conceptual

2.1.1 Rotating Polarizers

Problem

Suppose that you held two polarizing sheets in front of you and looked through both of them. How many times would you see the sheets lighten and darken

A) if one were rotated through one complete rotation

B) if both were rotated through one complete rotation at the same rate in opposite directions

C) if both were rotated through one complete rotation at the same rate in the same direction

D) if both were rotated through one complete rotation in opposite directions but one twice as fast as the other

[2]

Answer

Solution

A) twice

B) four times

C) none

D) six times

2.2 Non-Trig

2.2.1 Seafarer

Problem

Project Seafarer was an ambitious program to construct an enormous antenna for communicating by "radio" with submerged submarines. The effective wavelength emitted by this antenna was 10×10^4 Earth radii (6.4×10^6 m).

A) What would be the frequency?

B) What would be the period?

[1]

Answer

Solution

2.2.2 Broadcast

Problem

When we broadcast radio and TV, the signal goes not just to Earth, but out into space as well. Assuming no reflection or diffraction by our atmosphere or electric and magnetic fields in space, what would be the intensity of the signal from a 1.0 MW station on Earth if the signal were detected at Alpha-Centauri 4.3 light years away? (not a plane wave)

[1]

Answer

Solution

$$I = \frac{P}{A} = \frac{1.0 \times 10^6 \,\mathrm{W}}{4\pi r^2} \tag{2}$$

2.2.3 Sunlight

Problem

Sunlight strikes the earth, outside its atmosphere, with an average intensity of 1.4 $\frac{\mathrm{kW}}{\mathrm{m}^2}$. Calculate the amplitude of the electric and magnetic fields making up the sunlight assuming the waves are plane waves.

[1]

Answer

Solution

References

References

[1] Halliday and Resnick, *Fundamentals of Physics*, 3rd edition, Wiley, 1988. 3

[2] Wilson and Buffa, *College Physics*, 4th ed., Prentice Hall. 2