The simulation shows an experiment in which a laser beam is sent through a pair of slits to produce an interference pattern on a screen. If we turn down the intensity of the light so that only one photon at a time is sent through, we will find that:

A) Most of the photons hit the screen behind one of the slits
B) Photons are most likely to hit the screen between the two slits (where we had constructive interference)

Extra: if your answer is correct, what does it tell you about the behavior of individual photons?

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Extra: this suggests that single photons have properties (in this case interference) usually associated with waves

Light incident on a polarizer is polarized at 45 degrees relative to the polarizer. The transmitted intensity will be:

A) Zero

B) The same as the original intensity

C) Half the original intensity

D) $\frac{1}{\sqrt{2}}$ times the original intensity

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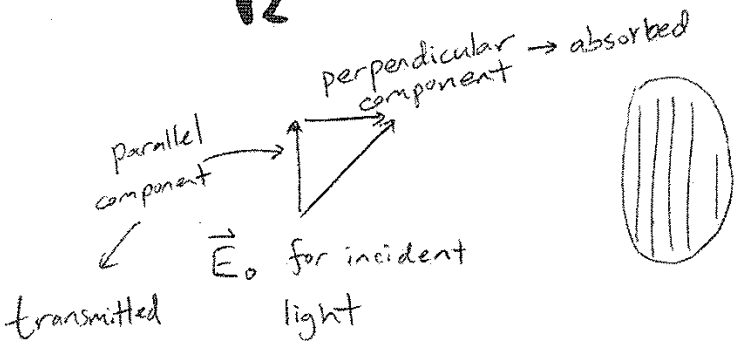

transmitted amplitude $\sim \frac{1}{\sqrt{2}} \times$ original

transmitted intensity $\sim \frac{1}{2} \times$ original.

A stream of photons with the same polarization is incident on a polarizer oriented at 45 degrees relative to the polarization direction of the photons. What happens?

A) All the photons go through, but each have half as much energy as before.

B) All the photons go through, with unchanged energy.

C) None of the photons go through.

D) Half of the photons pass through.

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same wavelength ∴ same energy/photon

half intensity ⟹ half as many photons

A beam of polarized photons is incident on a polarizer whose orientation is chosen so that the photons are either absorbed (with probability 1/3) or transmitted (with probability 2/3). What is the intensity of the transmitted light as a fraction of the intensity of the incident light?

A) 1/3

B) 1/9

C) 2/3

D) 4/9

E) I don't understand what probability means.

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$\frac{2}{3}$ of photons pass through

$\therefore \frac{2}{3}$ intensity since

intensity $\propto$ # photons/sec.