

An EM plane wave in free space comes from the left towards an interface.

Which statement is true?

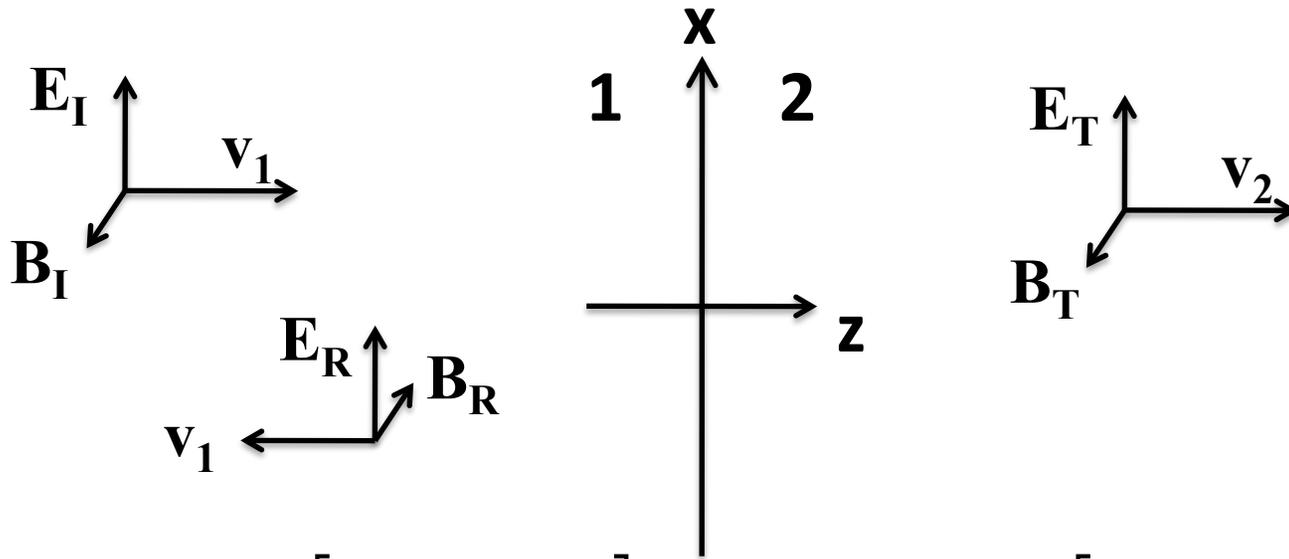
- A) Only certain frequencies are allowed.
- B) You are free to choose the wave speed.
- C) A compensating wave must travel towards the interface from the right too.
- D) You may independently select the frequency and the k-vector.
- E) None of the above.

An EM plane wave in free space comes from the left towards an interface.

Which statement is true?

- A) Only certain wave speeds are allowed.
- B) You are free to choose \mathbf{k} .
- C) A reflected wave on the left and a transmitted wave on the right may travel away from the interface too.
- D) All of the above.
- E) None of the above.

A plane wave normally incident on an interface between 2 linear (non-magnetic) dielectrics ($n_1 \neq n_2$)



$$E_I = \tilde{E}_{0I} \exp[i(k_1 z - \omega_1 t)] \quad E_T = \tilde{E}_{0T} \exp[i(k_2 z - \omega_2 t)]$$

$$E_R = \tilde{E}_{0R} \exp[i(-k_1 z - \omega_1 t)]$$

How do k_1 and k_2 compare? How do ω_1 and ω_2 compare?

A) $k_1 = k_2, \omega_1 = \omega_2$

B) $k_1 \neq k_2, \omega_1 \neq \omega_2$

C) $k_1 = k_2, \omega_1 \neq \omega_2$

D) $k_1 \neq k_2, \omega_1 = \omega_2$