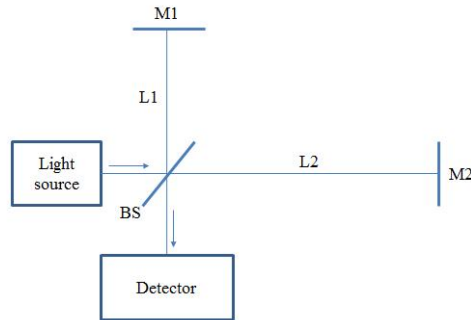


Pre-Report (Interference)

(1) Derive the interference signal of a laser interferometer for measuring the distance.



$$I(L2 - L1) = I_0 \left(1 + \cos \left(\frac{2\pi}{\lambda} [L2 - L1] \right) \right)$$

(2) How many interference fringes are observed when the M2 moves to 1 mm?

(3) When using a broadband light source, the interference signal can be expressed as the following. Please derive it.

$$I(f) = I_0 \left(1 + \cos \left(\frac{2\pi}{c} [L2 - L1] f \right) \right)$$

(4) If the light source have a spectral bandwidth of 1520 nm to 1560 nm. How many period of modulated signal can be observed in an interference spectrum for $L2 - L1 = 0.1$ mm?

(END)