Light, being a transverse wave, can be polarised, for example by allowing it to pass through a polarising filter. In a linearly polarised light wave, both the electric field $E$ and magnetic field $B$ oscillate in distinct planes. The orientation direction of the electric field oscillation is called the polarisation direction.

In this experiment light passes through two filters termed the polariser and the analyser, which are aligned at an angle of $\phi$ to one another. The polariser only allows one linearly polarised component of the light to pass through it. The electric field of this component may be deemed to have an amplitude $E_0$.

The amplitude of the component after passing through the analyser filter is given by

$$I = I_0 \cos^2 \phi$$

This is a measure of the amount of light which can pass through the analyser. The intensity of the light corresponds to the square of the electric field strength. The intensity of light beyond the analyser is therefore as follows:

$$I = E^2 \cos^2 \phi$$

where $I_0$ is the intensity of light after passing through the polariser. Equation (2) is a statement of Malus’ law. This will be verified in the experiment by measuring the light intensity using a light sensor. In this experiment, the intensity of light measured for an angle $\phi = 90^\circ$ should be equal to that of the ambient light. This value should be subtracted from all the other intensity measurements.