

APPENDIX I

PROCEDURE FOR SETTING THE MEASUREMENT SYSTEM

To setup the laser attenuation measurement system, all the components such as laser source, light intensity power meter, lens holders, plano-convex lenses and platforms must be prepared first. The batteries in the laser source and light intensity power meter are checked to ensure that the batteries can supply enough power. Each of the plano-convex lenses is inserted into a lens holder and it is tightened by using two locks on the sides of lens holder. These lenses have 15cm focal length and 5cm diameter.

Next, the laser source and light intensity power meter are placed at the end of each platform. The locks under the laser source and light intensity power meter are inserted into the holes approximately 6cm away from the edge of the platforms. The bolts are used to tighten the locks but it is recommended not to over-tighten the locks to let both components have some space to move for the adjustment. Each of the plano-convex lenses which have been tightened in the lens holders is placed 15cm away from the laser source and light intensity power meter. The legs of lens holders are placed inside the holes and tightened by the bolts. It is also recommended to let the lens holder to have some space for the movement.

Then, all the switches on the laser source and light intensity power meter are turned on. A piece of white paper is put between the lens holders to see the expanded laser beam. The paper is removed and let the laser beam hits the light intensity power meter. Adjustment is made to the position of light intensity power meter until the converged laser beam hits the surface of light dependent resistor (LDR). The voltage reading is obtained from the digital panel meter on the light intensity power meter.

By default, this light intensity power meter gives the maximum voltage of 5V when the laser beam is not directed to the LDR or the laser source is turned off and the minimum

voltage around 1.2V when the laser beam hits the LDR. If the plano-convex lens is changed to a different focal length such as 25cm, the procedure for setting this measurement system is still the same. However, both the plano-convex lenses which locked inside the lens holders are placed 25cm away from the laser source and light intensity power meter.