Using CylKit-01 Lenses to Correct your Laser Diode

Included in the package are two broadband AR coated cylindrical lenses: one convex) and one concave ((.

> **Caution**: You will be working with objects in the path of a laser beam. Wear eye protection and operate the laser at a safe power.

Overview: The correction optics are to be set up as pictured, with the beam coming in from the right of the diagram.
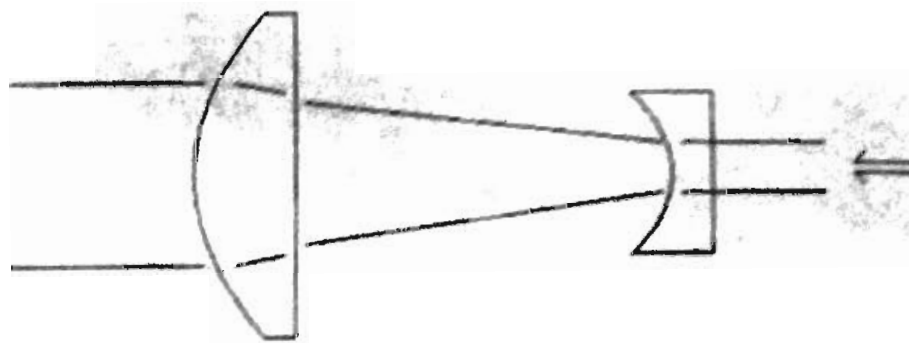

Fig. 1) Top view optics arrangement

Step 1: set up your laser diode collimator so that the fast axis (wide axis) is vertical and the emission is just above lasing threshold. Focus your collimating lens so that the far field pattern is a sharp horizontal line.

Step 2: Set the concave lens as close as possible to the aperture of the collimator so that the fast axis is along its height. Adjust the rotation of the collimator/diode assembly so that the emission field goes from this:

To this:

Proper alignment is critical. Bands should end up vertical, perpendicular to your lens mounting table.

Step 3: Set the convex lens in front of the concave lens as shown in fig. 1. Carefully slide it forward and back until an optimal far-field dot is achieved. You will want to turn the power up to induce and account for multimode fringes while fine tuning focus.
If you see a pattern like this:

It means your convex lens needs to be tilted with respect to the table to match your concave lens. If you see a pattern like this:

It means your convex and/or concave lens needs to be rotated on its vertical axis to align with the beam and each other. A slight rotation of the concave lens can be compensated with a larger opposite rotation of the convex lens.

It is possible to defocus the diode collimator in order to ensure the fast and slow axes divergence matches at far field. With a little experimenting and adjustment, you will end up with a tight, collimated beam of low divergence. Congratulations!