

How to align the S10 cross-correlator

To measure the UV laser pulse with cross-correlation (XCorScan) the IR and UV vectors must be overlaid on the crystal. There are some tips and tricks to achieving this

Step-by-step guide

1. Insert the pinhole (should have a collar in place). Install perpendicular to beam vector (by eyeball)
2. Using dichroic mirror, get IR through pinhole
 - a. Can either use high sensitivity cards or orange cards + phone camera
3. Steer the UV through the pinhole using downstream mirror
 - a. Having a very sharp sliver of paper can help; once the beam is near the center it should start to visibly fluoresce
 - b. Once the beam is through at all, continue to adjust mirrors to improve the "halo"
 - c. The final refinement should result in a beam not too far from the center of the halo (won't actually be centered!) but the tuning should be done such that the halo is as circular as possible
4. Next step is to check UV and IR upstream and downstream of iris
 - a. There are a few ways to do this. Can use white and orange sections of a high sensitivity card.
 - b. I've found that putting a 1.3 OD filter on the IR line reduces the amplitude of the IR enough that it doesn't wash out the UV on an orange card when viewed on a phone camera
 - c. Adjust UV line ONLY to get overlap both upstream and downstream
5. Replace pinhole with crystal
6. Using white paper with a small hole in it (<mm), let the UV pass through the card onto the crystal then look on the paper for the reflection. Adjust the angle of the crystal such that the reflection is ~perpendicular
7. Note the position of the manual delay stage
8. Keeping pressure on the side of the stage without the screw (i.e. keeping the linear bearings in compression) adjust the position, looking for a peak on the oscilloscope
9. If the signal is not found, more desperate measures might be necessary... time to break out the fast diode.