Re: d-scan questions

Noah Talisa <nbtosu1@gmail.com>
Tue 4/13/2021 6:39 PM
To: Justin T. <twardowski.justin@gmail.com>; Tripepi, Michael <tripepi.4@buckeyemail.osu.edu>

Hey no problem.

If I remember correctly, the labview code that I wrote for running FCP dscans (i.e. using the wedges) on the central computer sends serial commands to the translation stages that is used for the raster scan setup Kyle built a million years ago (I took one of the stages off of that setup to take FCP dscans right before I started writing, and then put it back into the setup after that, so the setup should still be intact somewhere). Michael will probably know what the raster scan setup looks like and where it is.

Anyways, the labview vi's I wrote for doing dscans for FCPs as well as for the compressor output should be on what was the central computer. You might have to dig around the file system to find the old directory that was from before that computer was repaired by the physics computer people. I think the hdd image can be accessed directly from the desktop.

For FCPs, you wanna make sure you use the 20 um thin BBO crystal. The way I separated the pump from the SH signal is by using the broadband wiregrid polarizer (the doubled light is cross-polarized with the pump), and focused the BBO output onto the fiber input. It's a good idea to focus the pump down on the BBO after significantly attenuating it first (via bounces off of prisms, etc.), so that a small area of the BBO is used, reducing the potential for sampling nonuniformities on the BBO surface. What I used to do was close the iris in my damage setup so that the focus of the beam is relatively large and the beam is attenuated even more.

When running FCP dscans, you need to make a measurement of the fundamental spectrum (my labview code has this step built in, so you don't have to worry about forgetting to do it). If you use the wiregrid polarizer to separate the residual pump from the doubled like, you have to make sure to adjust it slightly so that you are not near the minimum in pump transmission before measuring the fundamental spectrum. If you keep the polarizer at the minimum, the spectrum of what little pump makes it through IS NOT representative of the actual spectrum.

For the compressor Dscan, I also used the wiregrid polarizer to get rid of the residual pump. In this case, though, you can use a thicker BBO (50 or even 100-200 um thick) since the bandwidth is narrower (you don't need to worry so much about phasematching bandwidth issues). You can also just send the propagating mode to the crystal since the pulse energy is high, and the doubled light will most likely also have relatively high energy, so you don't need to focus it down onto the fiber input (just put the fiber in the beam).

I hope this helps.

-Noah

On Tue, Apr 13, 2021 at 5:18 PM Justin Twardowski <twardowski.justin@gmail.com> wrote:

> sorry for bothering you lol
> which computer had the program to run the motorized stage (maybe called nano mover), which we will put one of the wedges on? We checked labview on central computer but couldn't see the program listed.
> do you have any recommendations for running a d-scan over such a broad bandwidth? I recall you ran d-scan of the compressor. Also I reckon we will need some filters. I think we just need BBO, and then a filter to block out the non-frequency doubled light.
> If you have any other useful tips just lmk
> Justin