Hi Professor

This week, I encounter some issues with the power detector and the beam profile measurement. But with help of Calvin and Jon, the problem is not a big deal. It has been solved and goes well.

The problem of the power detector is that when I turn on the detector, the bias from the output occasionally rise up to the positive saturation or drop down to negative saturation, when that happens, we couldn’t measure the correct chopped power since the fluctuation will be cut off. Calvin suggests me to connect external resistance and capacitance parallelly. After I finished the setup, the output bias become normal and work perfectly.

As the measure beam profile takes too long time for stepper motor scanning stage (about 10 mins ),I am going to use the camera to measure the beam profile .Since the camera require an additional focusing lens for imaging , with help of Jon, I setup a camera stage with lens in front of focus ,Hoping that would work for beam profile measurement.

I also improve the 1D FDTD numerical method with 2 order precision time discretization and 4 order precision space discretization (2,4) which greatly reduce the phase error for 1D simulation. The previous (2,2) has seriously phase error when simulate the high frequency EMW in plasma, which couldn’t apply to the phase analysis under the tokamak for the influence evaluation with strong sheared magnetic field.

Finally ,the vacuum pump for formic gas laser seems to have some problem ,the pressure can’t decrease to minimum value as usually .Jon swap the vacuum pump with the old one ,and the old one works well .

Hi Professor,

This week, I encountered some issues with the power detector and the beam profile measurement. However, with the help of Calvin and Jon, the problems were manageable and have been resolved.

The issue with the power detector was that, upon turning it on, the output bias would occasionally rise to positive saturation or drop to negative saturation. When this happened, we couldn’t accurately measure the chopped power because the fluctuations were cut off. Calvin suggested connecting an external resistor and capacitor in parallel. After implementing this setup, the output bias normalized and has been working perfectly.

Regarding the beam profile measurement, the stepper motor scanning stage takes too long (about 10 minutes) to complete the measurement. To address this, I plan to use a camera for beam profile measurements. Since the camera requires an additional focusing lens for imaging, with Jon's help, I set up a camera stage with a lens in front of the focal plane. I hope this setup will work effectively for beam profile measurements.

I also improved the 1D FDTD numerical method by implementing second-order accuracy time discretization and fourth-order accuracy spatial discretization (2,4), which significantly reduces phase error in 1D simulations. The previous (2,2) scheme had severe phase errors when simulating high-frequency electromagnetic waves in plasma, making it unsuitable for phase analysis in tokamak scenarios with strong sheared magnetic fields.

Finally, the vacuum pump for the formic acid laser seems to have an issue, as the pressure no longer decreases to its usual minimum value. Jon replaced the vacuum pump with an older one, and the older pump is functioning well.

Have a good weekend!

Best regards

Xinhang