**HW Set 3: CH226 Due Next Friday**

Download the SNLO software for free from <https://as-photonics.com/snlo/>. If you have any issues downloading it or need to borrow a computer to use the software, contact your TA for assistance. Please include screenshots and all relevant results of your calculations!

**Problem 1.** Qmix calculates phase matching conditions for a specified crystal and wavelengths. Use Qmix to calculate the crystal orientation θ you would need for SHG with an 800 nm pump in a BBO crystal. What value of deff do you get?

A screenshot of a computer

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**Problem 2.** An optical parametric oscillator has a 355 nm pump laser with a pulse duration of 7 ns. You want to do type I mixing in an OPO to access a frequency range of 400 – 2600 nm, use the opoangles calculation to determine which of the following crystals would be best suited for this energy range. Explain why you chose that crystal and why the others would not work as well.

* DKDP
* KNbO3
* KTiPO4
* LBO

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~~For a different application, you want to use a 1064 nm pump pulse to access the region between 1.2 - 5 um. Which of the crystals above would be best?~~

~~Calculate the optimal angles to produce a signal = 1500 nm and idler = 3500 nm. Draw the k vectors that preserve momentum with respect to the optic axis.~~

**~~Problem 3.~~** ~~Navigate to Example 10 (under Examples on the SNLO main menu), which calculates the properties of quasiphasematch (QPM) in KNbO~~~~3~~~~. What poling period and starting polarization would you need to generate Y-polarized 1540 nm photons and X-polarized 1460 nm photons?~~