What do we want to do over the next 30 days? The goal is to provide lab management with a recommendation, install the booster at CEBAF or not. And we agree, we want to write a paper describing UITF, right?

Our optics studies:

Dennis: qsutility to measure emittance and to provide beam envelope function (beta function) along the length of the accelerator, and to estimate the quality of our beta function “match” across the booster. Then adjust solenoid and quad settings to improve the match? How will we know we’ve improved the match? Emittance at keV and MeV, normalized emittance should be the same. Can we demonstrate a good and bad match?

Xi: use GPT to predict the beta function along the length of the accelerator and then measure beam sizes at viewers and harps, and compare to GPT predictions.

The studies listed above are for on-crest operation of the booster.

Do this at 8 MeV/c in support of water irradiation tests? Or do this at 6.4 MeV/c in support of CEBAF operations?

Max: energy spread estimates, difficult with so much jitter. For on crest and off crest operation? For different buncher amplitudes, and for different gun voltages?

We have a limited set of diagnostics. Is there anything else we can measure that speaks to our confidence in our model or that highlights are keen understanding of the machine.

Booster Characterization:

We already calibrated the GSets of both cavities, we know how much each cavity can accelerate the beam. Our accelerator can provide 10 MeV/c beam, we don’t need to push it higher.

Dennis: does qsUtility tell us something about the optical properties of the booster? Focusing/defocusing strength?

Yan: measure beam deflection through the booster, associated with each cavity. Measure x/y coupling. Can you determine how aligned the two cavities are? Max and I think the cavities are not well aligned, because to center in each cavity we need to adjust the upstream launch

Max: energy jitter measurements, quantify the jitter, correlated to microphonics assessment? Quantify the microphonics

UITF studies:

Matt: Using the Brock cavity to set the buncher amplitude

Chopper studies: use the chopper, does the MeV spectrometer see a difference? Absence of DC background, smaller energy spread?

Work with I&C to improve BPMs (maybe they function properly in tune mode?). Dither the beam with keV steering magnets, observe smaller motion at MeV BPMs (i.e., adiabatic damping)

Work with Reza and Tomasz to commission a yao bunchlength time of flight system, to better set phases. Can this provide a measure of the electron bunchlength?

Anything related to the gun? keV spectrometer, energy spread? Lifetime? Biased anode?