E326 Long-term planning

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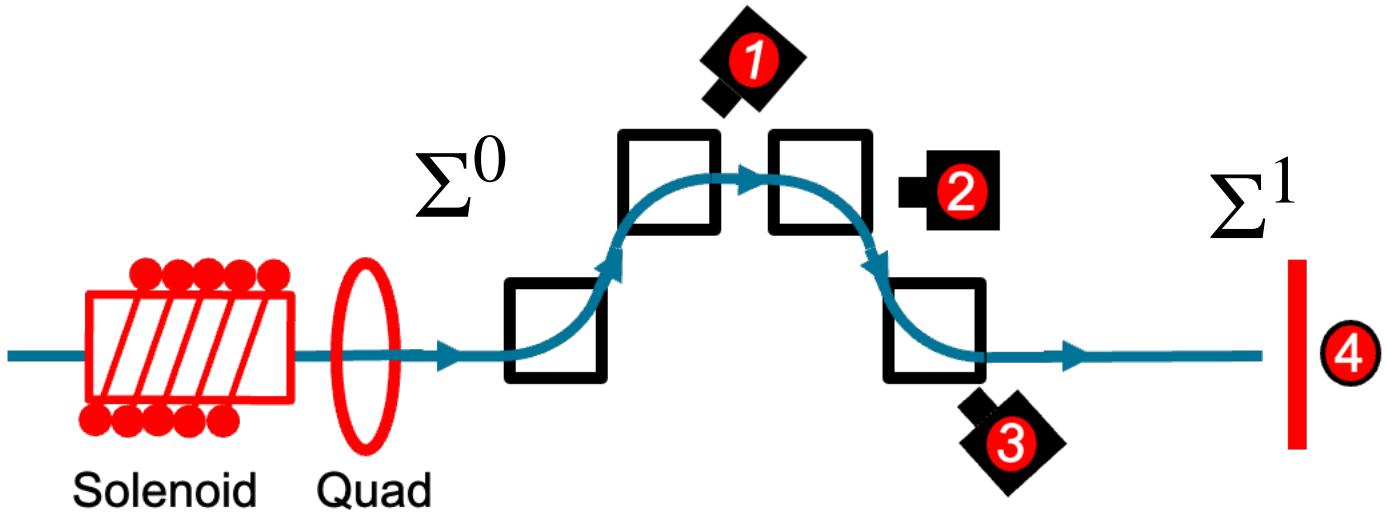
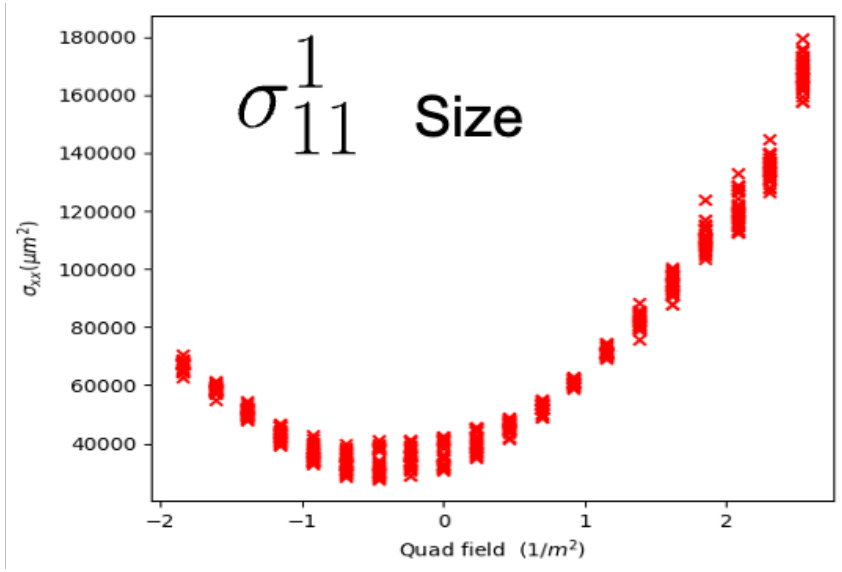
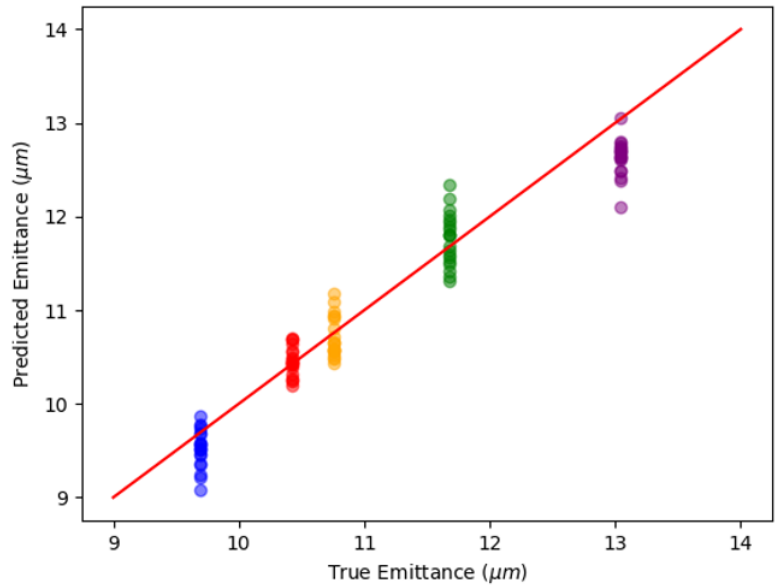
What went right

It worked!

- Primary way we took data was to "quad scan through the dogleg"
- Move the sigma matrix using transport matrices

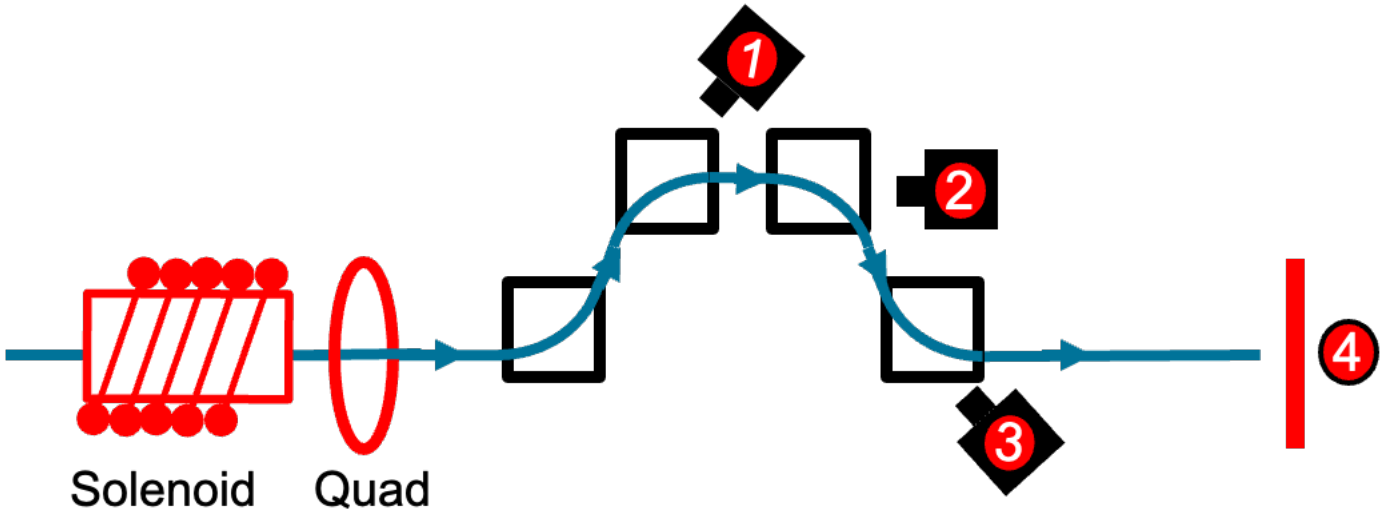




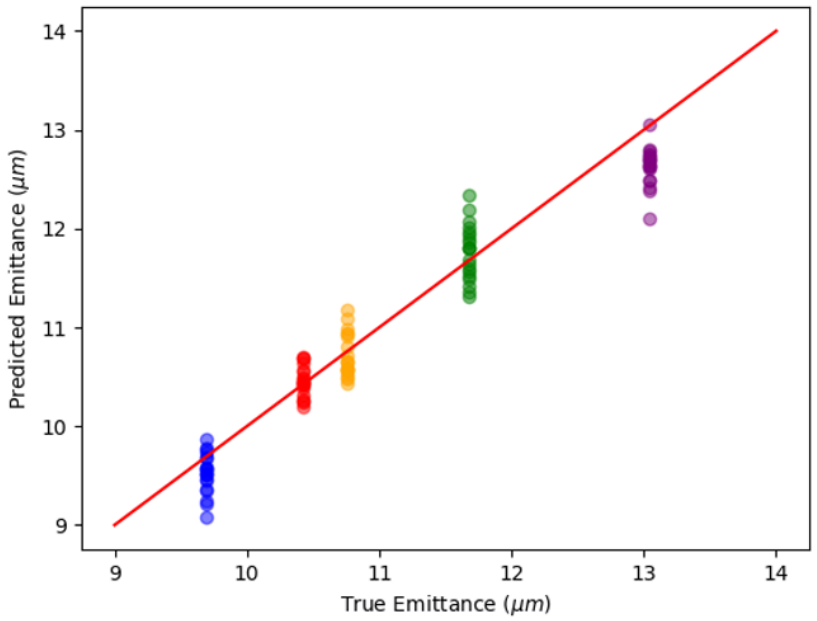


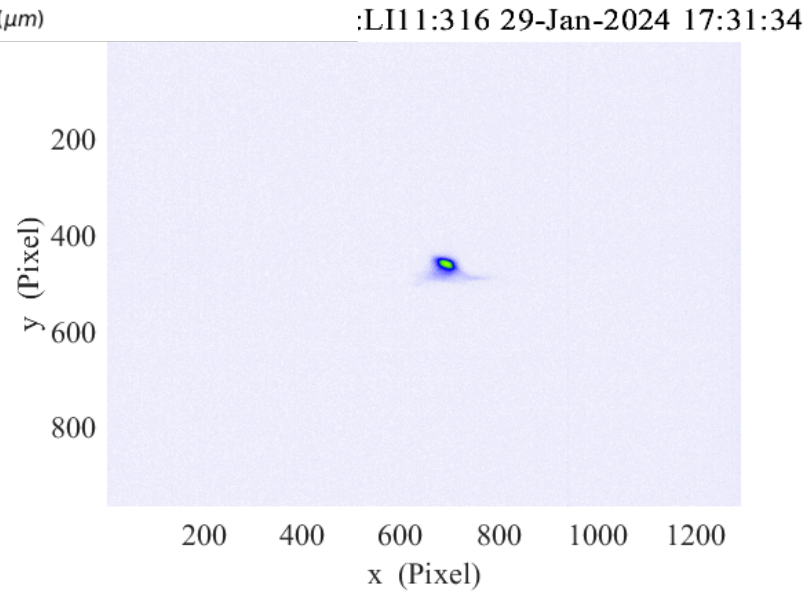
What could have gone better and what is next?

- It currently works at 3 nC, very narrow energy spread
- Emittance measured is larger than on PR10571 - do the wire scanners after BC11 work? Is emittance growth expected?
- BLEN 11 aperture is challenge to quad scan, is it centered?



What is next?

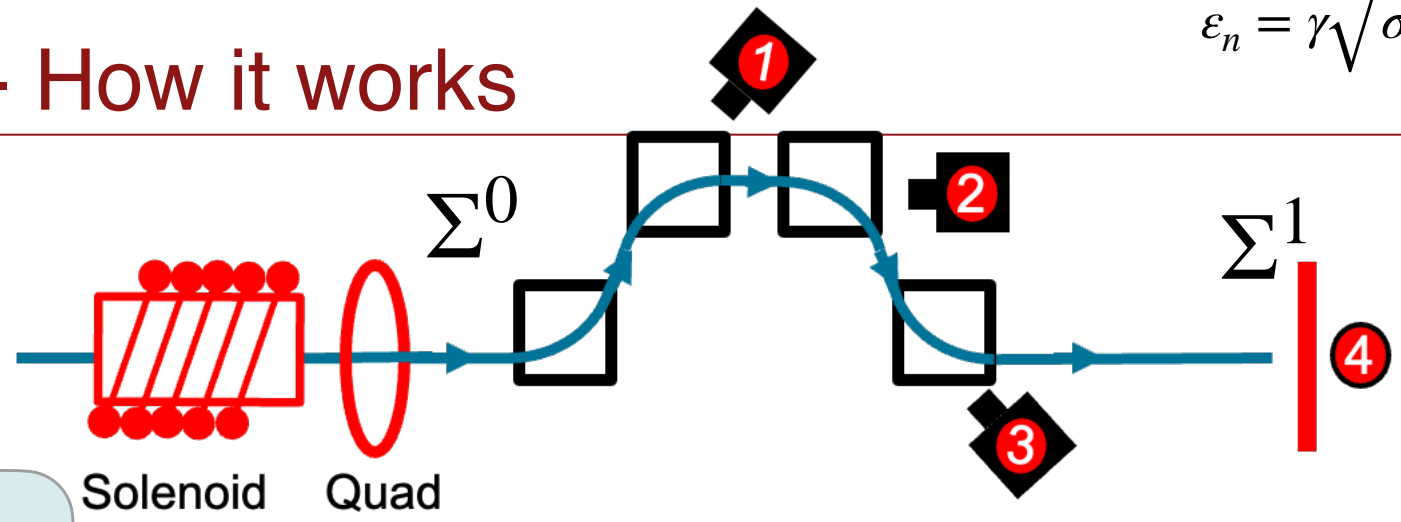


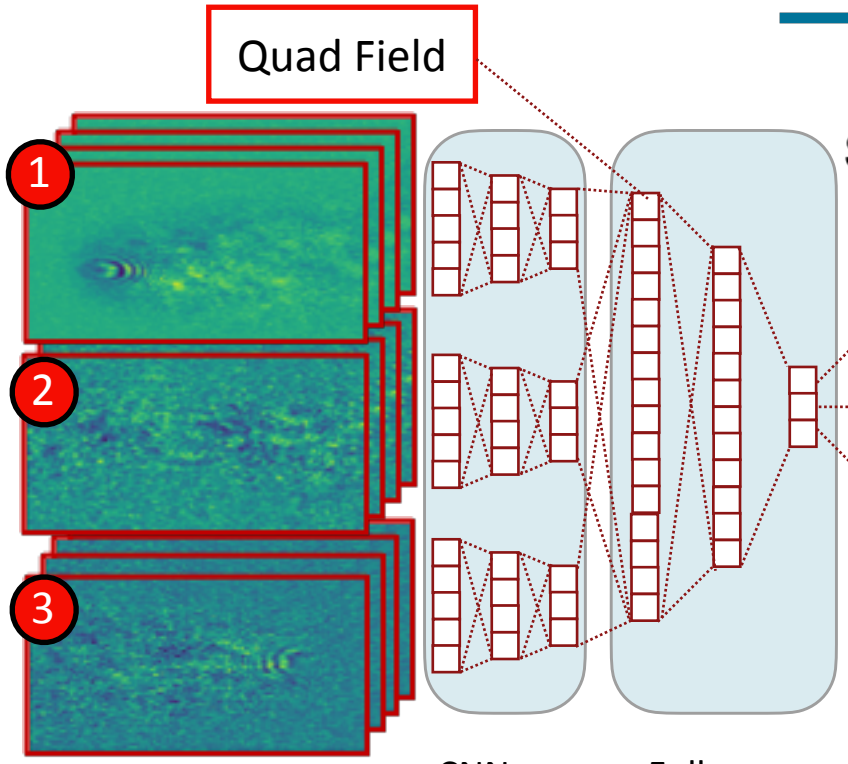


- Incorporate into experiments
- To get to lower charge, need more photons. Look for optics to increase f/#, magnification + focal length, phosphor, CMOS cameras?
- Investigate low energy spread model through BC11 to use with experiments
- Couple with injector tuning to fill in blanks
- Figure out what is going on with B1
- Scan L1 phase to build a model for energy spread
- Work on dispersion (or whatever) in BC11 to try and measure X
- Devise small energy spread injector configuration that allows science in S20

Edge Radiation - How it works

$$\varepsilon_n = \gamma\sqrt{\sigma_{11}\sigma_{22} - \sigma_{12}^2}$$



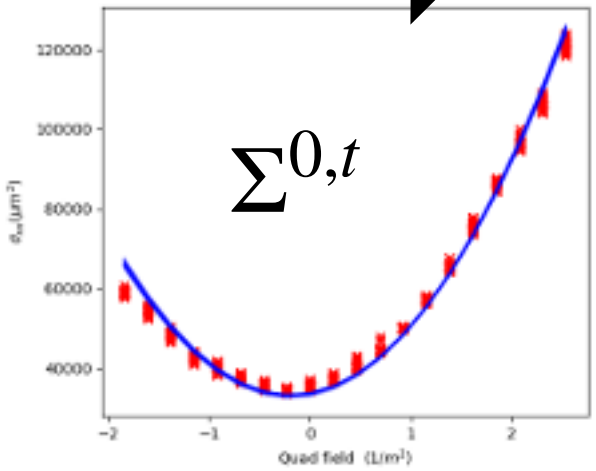


$$\left.\begin{matrix}\sigma_{11}^{1,NN} \\ \sigma_{12}^{1,NN} \\ \sigma_{22}^{1,NN}\end{matrix}\right\} \Sigma^{1,NN}$$

CNN Encoder

Fully Connected

$$\Sigma^{1,t} = R \cdot \Sigma^{0,t} \cdot R^T$$



$$L = \left(\Sigma^{1,NN} - \Sigma^{1,t}\right)^2$$