



Kaon LT Status Update

June 24th, 2020

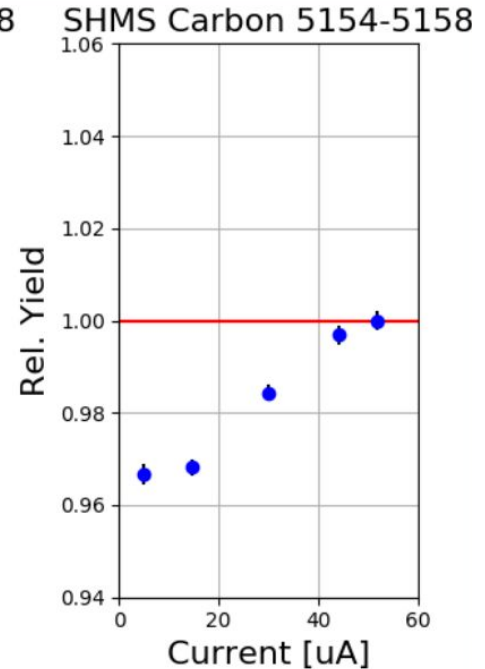
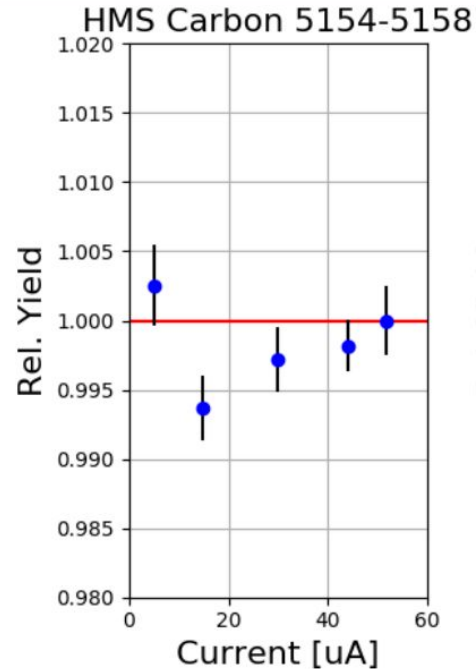
Richard Trotta

KaonLT package

- Just about finished
- Stephen and I worked through the remaining issues
- Everything seems to be working properly now
 - I need to reorganize error messages still, sorry Stephen 😞
- I also have some ideas for optimization using pandas which will streamline things even more
 - Future thinking

Successfully Reproduced Lumi Plots

- Successfully reproduced some old lumi plots
- I ran over all luminosity runs but came across a few issues
 - Mainly runs missing in the cuts files that I need to add
 - A few runs gave results that were clearly wrong (e.g. 30% efficiencies) but I think, again, this is just issues with specific cuts I need to adjust



European Center for Theoretical Studies (ECT)

- Rigorous 2-week program I started on Monday covering Machine Learning and Data Analysis
- I have already learned a lot of techniques that could be very useful for us!
 - Check out the github where they are posting everything!
 - <https://github.com/NuclearTalent/MachineLearningECT>
 - Basic concepts of machine learning and data analysis and statistical concepts like expectation values, variance, covariance, correlation functions and errors;
 - Estimation of errors using cross-validation, blocking, bootstrapping and jackknife methods;
 - Optimization of functions
 - Linear Regression and Logistic Regression;
 - Dimensionality reductions, from PCA to clustering
 - Boltzmann machines;
 - Neural networks and deep learning;
 - Convolutional Neural Networks
 - Recurrent Neural Networks and Autoencoders
 - Decisions trees and random forests
 - Support vector machines and kernel transformations