02/02/2023

**Paper:** [**https://doi.org/10.1140/epjp/s13360-021-01348-5**](https://doi.org/10.1140/epjp/s13360-021-01348-5)

Problem, usually correction is made few times a year, multiple magnets at a time. Goal, predict individual magnet errors as misalignment, sextupoles…

**INPUT:** deviation of the optic measurement from design \Delta(x)

**OUTPUT:** In this case, effective quadrupole field errors

source of the problem (change in intensity of field? position of magnet? Intensity of current of electromagnet?)

* Correction of the problem compensating predicted errors

How does mad-X work

**Pregunta**: The paper does not talk about the correlation between change in field and an applicable correction ie repositioning of magnet, intensity change

03/02/2023

**Paper: Thesis Tobias Persson**

Summary on beam optics theory.

Summary on beam measurements.

* Exciting the beam
* Phase
* beta
* K modulation
* Dispersion

Summary on beam corrections and procedures.

**Expected workflow:**

1 Generation of possible magnet errors using MAD-X (ARTIFICIAL Y)

2 Simulation using MAD-X => OPTIC MEASUREMENTS (X)

3 Algorithm training and selection Y\_pred = f(X)

4 Validation using model data and new EXPERIMENTAL DATA

Y => Deviation in magnetic field

X => beta(?)

Today I read and understood most of the theoretical part of the thesis, set up my github and played with MADX simulation data an OMC3 software.

06/02/2023

Ideas:

1. Non-linear optic errors

2. Measurement=>optic functions

08/02/2023

Running first MADX script.

Dont request many files from afs => DDOS.

Understand how to generate data from MADX.

Reading documentation for OMC python package

09/02/2023

This project is highly dependant on accelerator physics knowledge. I have to study and understand the problem. Lots of reading.

Trying to read .npy data from Elena does not work. Trying to run her script doesnt work either because of library dependencies.