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