

meeting 2008-06-26 Requirements for Beta Matching

Attendance: Patrick, Greg, Debbie, Paul Emma, Joe Frisch, Juhau, Henrik, Rick

Meeting Notes

Patrick presented High Level Application Requirements for a Beta Matching.ppt, attached (Under Attachments tab at top of page).

Cecile's current Beta match app uses Matlab's FMINSEARCH (sometimes takes a while to converge). Java version could either use matlab's java builder FMINSEARCH or equivalent algorithm. Will research/compare.

Cecile's had a gain factor which was not used very much, if at all.

Desire to match to any slice input. Patrick will change slide.

Under GUI/ user inputs -

- allow weighting factors and fitting constraint bands; soft constraints for alphas and betas
- allow user input of soft limits for magnets, as the BMIN and BMAX's are sometimes not useful for operations.
- show constraints on graph

In emittance app (also discussed previously during emittance requirements review) show the following parameters: design alpha/beta/asymmetry and limits on quads at PROF/WIRE

For BMAG_X + BMAG_Y result, divide by 2 (to normalize to "1")

Propagate Twiss backwards to upstream marker point that makes sense.

Integrate with SCORE API for backout purposes

Options for constraints:

- 1) minimize strength
- 2) minimize change
- 3) minimize difference from design (config/ or reference); editable in case design values are off
- 4) or, minimize $(\beta)^2 / (\text{focal length})^2$ per quad (suggestion by Paul)

Start by picking one way, like 4) to implement constraints for Phase 1. Architecture to allow easy addition & modification of constraint implementations.

Need adjustable weighting on target parameters and actuators.

Need to check emittance measurement results for reasonableness. If this Beta Match interfaces to Henrik's emittance app, perhaps Henrik's emittance app needs more smarts. Henrik has a constraint that doesn't write to PVs for emittance = zero... Henrik will need store more error bars.

Multi-knobbing of beta match values is a definite Phase 2.