HL-LHCV1.0 Tracking Tools

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Tracking tools changes (a.k.a. mask file)

- Assign field quality imperfections and misalignments to magnets.

- Add beam-beam lenses.

- Compute corrector circuit strengths.

- Prepared by Stephane for SLHCV3 variants, here adapted for HLLHCV1.0 due to:

  - split of Q1 and Q3 and change of names

  - issues for certain squeezed β^* .

Directory structure

- Same structures and general principle as SLHCV3.1b

    - `HLLHCV1.0/errors`: contains error assignment routines, error tables for HL magnets and correction scripts:

        - `Efcomp_MQXF.madx`: split of Q1 and Q3 with opposite orientations, change of names MQXC/D to MQXFA/B

        - `corr_tripD1_v2`: change of names of triplet (MQXC/D to MQXFA/B) and a2 corrector (l.MQSX3 to MCQSX3)

        - `corr_value.madx`: change kmax_MQSX to kmax_MCQSX

        - `corr_MB_v2`: change of logic to assign focusing and defocusing trim quadrupole families (before based on betx/bety, now based on quad name) because failing on certain beta* combinations.

    - `HLLHCV1.0/beambeam`: copied verbatim from SLHCV3.1b no need of changes (not tested).

    - `HLLHCV1.0/toolkit/align_sepdip.madx`: macros for correcting the position of the sep/rec dipoles (see example in the mask file).

    - HLLHCV1.0/job_tracking.mask: adapted from 3.1b (notably disabled B2s and B2r for D2 because of potential failure of coupling correction).

High Luminosity LHC

Mag. Orientation

IP =Q1a||Q1b= =Q2a||Q2b= =Q3a||Q3b=

name	orientation	name	orientation	B1/B2
MQXFA.A1R1/5	norm	MBXA.4L1/5	inv	n/a
MQXFA.B1R1/5	inv	MBXA.4R1/5	norm	n/a
MQXFA.A1L1/5	inv	MBRD.4L1/5	norm	V2/V1
MQXFA.B1R1/5	norm	MBRD.4R1/5	inv	V2/V1
MQXFB.A2R1/5	norm	MQYY.4L1/5	norm	V2/V1
MQXFB.B2R1/5	inv	MQYY.4R1/5	inv	V2/V1
MQXFB.A2L1/5	inv	MQYL.5L1	inv	V1/V2
MQXFB.B2L1/5	norm	MQYL.5R1	inv	V2/V1
MQXFA.A3R1/5	norm	MQYL.5L5	norm	V2/V1
MQXFA.B3R1/5	inv	MQYL.5R5	norm	V1/V2
MQXFA.A3L1/5	inv	MQYL.5L6	norm	V1/V2
MQXFA.B3R1/5	norm	MQYL.5R6	norm	V1/V2