PS-Booster Ejection Correction Dipoles

Goal

Attempt to reproduce the results in http://wwwpsco.cern.ch/private/gm/gmdescrip/LINC-Note.pdf

- Used the latest configuration files for **Ring 3** from Vivien for the ring
- **Matched the optics in MADX (32 bits)** to get the tunes $Q_H = 4.17$ and $Q_V = 5.23$
- After add a horizontal or vertical kick from one of the correction dipoles
- Compare the closed orbit with the one from the note
- Extract the geometrical relations between the kicks at the entry point and at the center of the ejection Septum, SMH15L1
- Try different configuarions

Head-to-head Comparison

- Configuration 1: **Default 2014 MADX Files**
  - DHZ,DVT 4L1 at=1.3355
  - DHZ,DVT 11L1 at=0.296
  - SMH15L1 4L1 at=0.909892
- Configuration 2: **Default 2014 MADX Files, SMH15L1 moved downstream by $\simeq$12 cm**
  - DHZ,DVT 4L1 at=1.3355
  - DHZ,DVT 11L1 at=0.296
  - SMH15L1 4L1 at=0.909892+0.126003
- Configuration 3: **2009 Configuration**
  - DHZ,DVT 4L1 at=1.426
  - DHZ,DVT 11L1 at=0.333
  - SMH15L1 4L1 at=0.909892
- Configuration 4: **2009 Configuration, SMH15L1 moved downstream by $\simeq$12 cm**
  - DHZ,DVT 4L1 at=1.426
  - DHZ,DVT 11L1 at=0.333
  - SMH15L1 4L1 at=0.909892+0.126003

ToDo Next

- Introduce the found shift from Tobias Dobers for DVT4L1 and DVT11L1
- Introduce the SMH15L1 values for the blade position from Mike Hourican

Table 1: Comparison for the geometrical relation between the kicks in the different PSB sections at the center of SMH15L1

Kicker	Note Values	Config. 1	Config. 2	Config. 3	Config. 4
	"entrance"	**central**	**central**	**central**	**central**
BE3.DHZ4L1	ΔX_{ES}[mm] = 0.760 · DHZ4L1 [mrad]	0.725	0.845	0.637	0.758
	$\Delta X'_{ES}$[mm] = 0.947 · DHZ4L1 [mrad]	0.952	0.952	0.955	0.955
BE3.DHZ11L1	ΔX_{ES}[mm] = 5.615 · DHZ11L1 [mrad]	5.639	5.650	5.627	5.639
	$\Delta X'_{ES}$[mm] = 0.104 · DHZ11L1 [mrad]	0.092	0.092	0.098	0.098
BE3.DVT4L1	ΔY_{ES}[mm] = -2.122 · DVT4L1 [mrad]	-2.046	-2.058	-2.027	-2.042
	$\Delta Y'_{ES}$[mm] = 0.021 · DVT4L1 [mrad]	-0.095	-0.095	-0.119	-0.119
BE3.DVT11L1	ΔY_{ES}[mm] = 0.669 · DVT11L1 [mrad]	0.350	0.248	0.374	0.273
	$\Delta Y'_{ES}$[mm] = -0.793 · DVT11L1 [mrad]	-0.806	-0.806	-0.803	-0.803

Table 2: Comparison for the geometrical relation between the kicks in the different PSB sections at the entrance of SMH15L1

Kicker	Note Values	Config. 1	Config. 2	Config. 3	Config. 4
	"entrance"	**entrance**	**entrance**	**entrance**	**entrance**
BE3.DHZ4L1	ΔX_{ES}[mm] = 0.760 · DHZ4L1 [mrad]	0.125	0.245	0.036	0.156
	$\Delta X'_{ES}$[mm] = 0.947 · DHZ4L1 [mrad]	0.952	0.952	0.955	0.955
BE3.DHZ11L1	ΔX_{ES}[mm] = 5.615 · DHZ11L1 [mrad]	5.581	5.592	5.565	5.577
	$\Delta X'_{ES}$[mm] = 0.104 · DHZ11L1 [mrad]	0.092	0.092	0.098	0.098
BE3.DVT4L1	ΔY_{ES}[mm] = -2.122 · DVT4L1 [mrad]	-1.986	-1.998	-1.952	-1.967
	$\Delta Y'_{ES}$[mm] = 0.021 · DVT4L1 [mrad]	-0.095	-0.095	-0.119	-0.119
BE3.DVT11L1	ΔY_{ES}[mm] = 0.669 · DVT11L1 [mrad]	0.858	0.756	0.880	0.779
	$\Delta Y'_{ES}$[mm] = -0.793 · DVT11L1 [mrad]	-0.806	-0.806	-0.803	-0.803