

# 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 configurations

## 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: **2007/2009 Configuration**
  - DHZ,DVT 4L1 at=1.426
  - DHZ,DVT 11L1 at=0.333
  - SMH15L1 4L1 at=0.909892
- Configuration 4: **2007/2009 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”	<b>central</b>	<b>central</b>	<b>central</b>	<b>central</b>
BE3.DHZ4L1	$\Delta X_{ES}[\text{mm}] = 0.760 \cdot \text{DHZ4L1} [\text{mrad}]$	0.725	0.845	0.637	0.758
	$\Delta X'_{ES}[\text{mm}] = 0.947 \cdot \text{DHZ4L1} [\text{mrad}]$	0.952	0.952	0.955	0.955
BE3.DHZ11L1	$\Delta X_{ES}[\text{mm}] = 5.615 \cdot \text{DHZ11L1} [\text{mrad}]$	5.639	5.650	5.627	5.639
	$\Delta X'_{ES}[\text{mm}] = 0.104 \cdot \text{DHZ11L1} [\text{mrad}]$	0.092	0.092	0.098	0.098
BE3.DVT4L1	$\Delta Y_{ES}[\text{mm}] = -2.122 \cdot \text{DVT4L1} [\text{mrad}]$	-2.046	-2.058	-2.027	-2.042
	$\Delta Y'_{ES}[\text{mm}] = 0.021 \cdot \text{DVT4L1} [\text{mrad}]$	-0.095	-0.095	-0.119	-0.119
BE3.DVT11L1	$\Delta Y_{ES}[\text{mm}] = 0.669 \cdot \text{DVT11L1} [\text{mrad}]$	0.350	0.248	0.374	0.273
	$\Delta Y'_{ES}[\text{mm}] = -0.793 \cdot \text{DVT11L1} [\text{mrad}]$	-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”	<b>entrance</b>	<b>entrance</b>	<b>entrance</b>	<b>entrance</b>
BE3.DHZ4L1	$\Delta X_{ES}[\text{mm}] = 0.760 \cdot \text{DHZ4L1} [\text{mrad}]$	0.125	0.245	0.036	0.156
	$\Delta X'_{ES}[\text{mm}] = 0.947 \cdot \text{DHZ4L1} [\text{mrad}]$	0.952	0.952	0.955	0.955
BE3.DHZ11L1	$\Delta X_{ES}[\text{mm}] = 5.615 \cdot \text{DHZ11L1} [\text{mrad}]$	5.581	5.592	5.565	5.577
	$\Delta X'_{ES}[\text{mm}] = 0.104 \cdot \text{DHZ11L1} [\text{mrad}]$	0.092	0.092	0.098	0.098
BE3.DVT4L1	$\Delta Y_{ES}[\text{mm}] = -2.122 \cdot \text{DVT4L1} [\text{mrad}]$	-1.986	-1.998	-1.952	-1.967
	$\Delta Y'_{ES}[\text{mm}] = 0.021 \cdot \text{DVT4L1} [\text{mrad}]$	-0.095	-0.095	-0.119	-0.119
BE3.DVT11L1	$\Delta Y_{ES}[\text{mm}] = 0.669 \cdot \text{DVT11L1} [\text{mrad}]$	0.858	0.756	0.880	0.779
	$\Delta Y'_{ES}[\text{mm}] = -0.793 \cdot \text{DVT11L1} [\text{mrad}]$	-0.806	-0.806	-0.803	-0.803