PS-Booster Ejection Correction Dipoles

Goal

First 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 center of the ejection Septum, SMH15L1

Head-to-head Comparison

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

Kicker	Note	Private MADX
BE3.DHZ4L1	ΔX_{ES}[mm] = 0.760 · DHZ4L1 [mrad]	ΔX_{ES}[mm] = 0.725 · DHZ4L1 [mrad]
	$\Delta X'_{ES}$[mm] = 0.947 · DHZ4L1 [mrad]	$\Delta X'_{ES}$[mm] = 0.952 · DHZ4L1 [mrad]
BE3.DHZ11L1	ΔX_{ES}[mm] = 5.615 · DHZ11L1 [mrad]	ΔX_{ES}[mm] = 5.639 · DHZ11L1 [mrad]
	$\Delta X'_{ES}$[mm] = 0.104 · DHZ11L1 [mrad]	$\Delta X'_{ES}$[mm] = 0.092 · DHZ11L1 [mrad]
BE3.DVT4L1	ΔY_{ES}[mm] = -2.122 · DVT4L1 [mrad]	ΔY_{ES}[mm] = -2.046 · DVT4L1 [mrad]
	$\Delta Y'_{ES}$[mm] = 0.021 · DVT4L1 [mrad]	$\Delta Y'_{ES}$[mm] = -0.095 · DVT4L1 [mrad]
BE3.DVT11L1	ΔY_{ES}[mm] = 0.669 · DVT11L1 [mrad]	ΔY_{ES}[mm] = 0.350 · DVT11L1 [mrad]
	$\Delta Y'_{ES}$[mm] = -0.793 · DVT11L1 [mrad]	$\Delta Y'_{ES}$[mm] = -0.806 · DVT11L1 [mrad]

Questions

- Do the results change for the 4 rings? **No, is it expected?**
- Does the position of the kicker matter? **Yes. E.g., by moving DHZ4L1 4 cm towards the beam I get much closer values of the ones in the note.**
- Which is the desired level of agreement? **To be discussed with Bettina/Vivien. It is difficult for me to judge without errors associated to estimations**
- Where to estimate the geometrical relations? **the note says "entrance of the ejection septum", although I think they used the center. I tried at the beginning of SMH15L1, but got not compatible values**

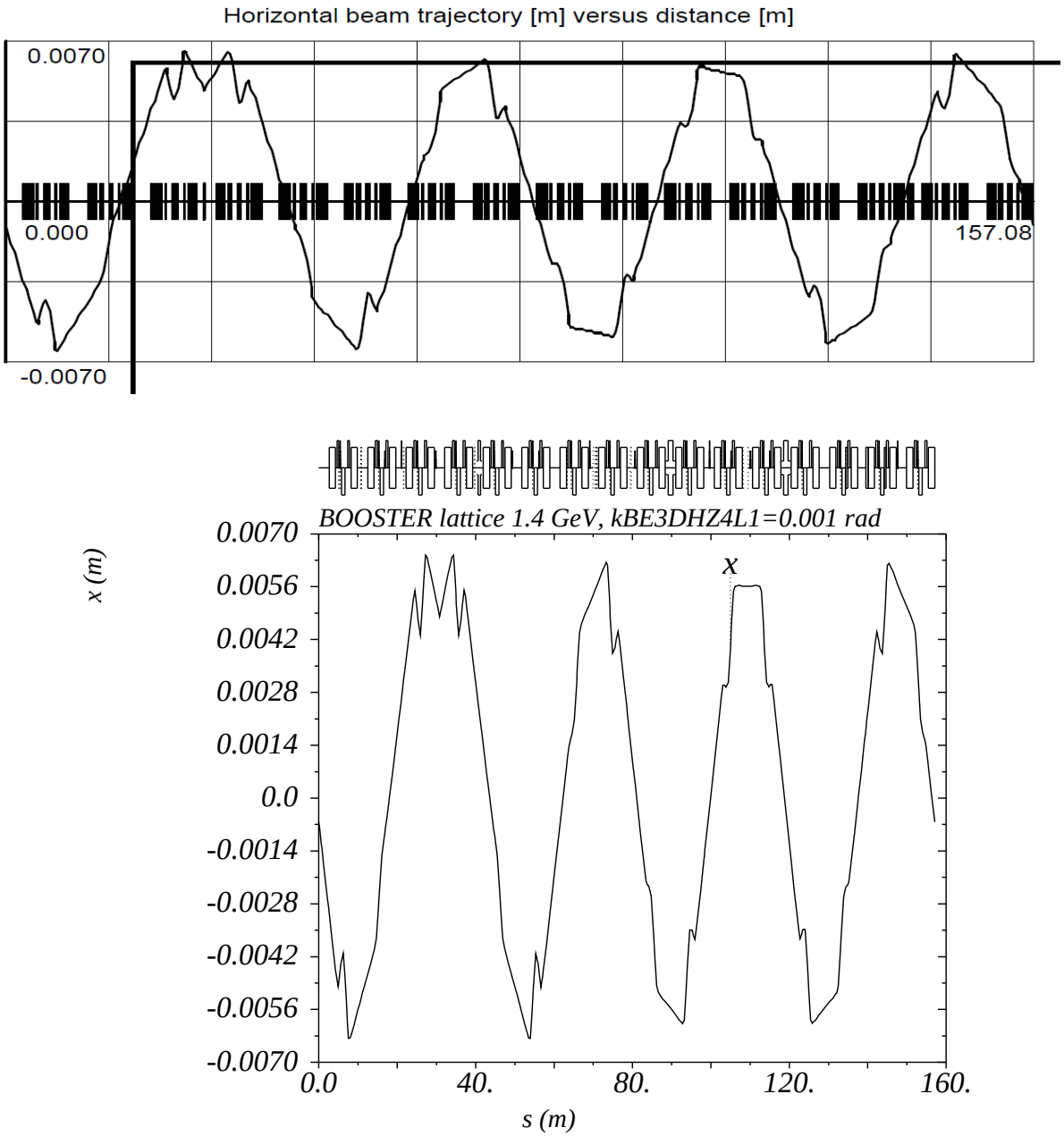

Figure 1: Closed Orbit comparison for a kick of 1 mrad for BE3.DHZ4L1. Top: from the note PS/OP/Note 99-xx of M. Benedikt. Bottom: Private MADX files

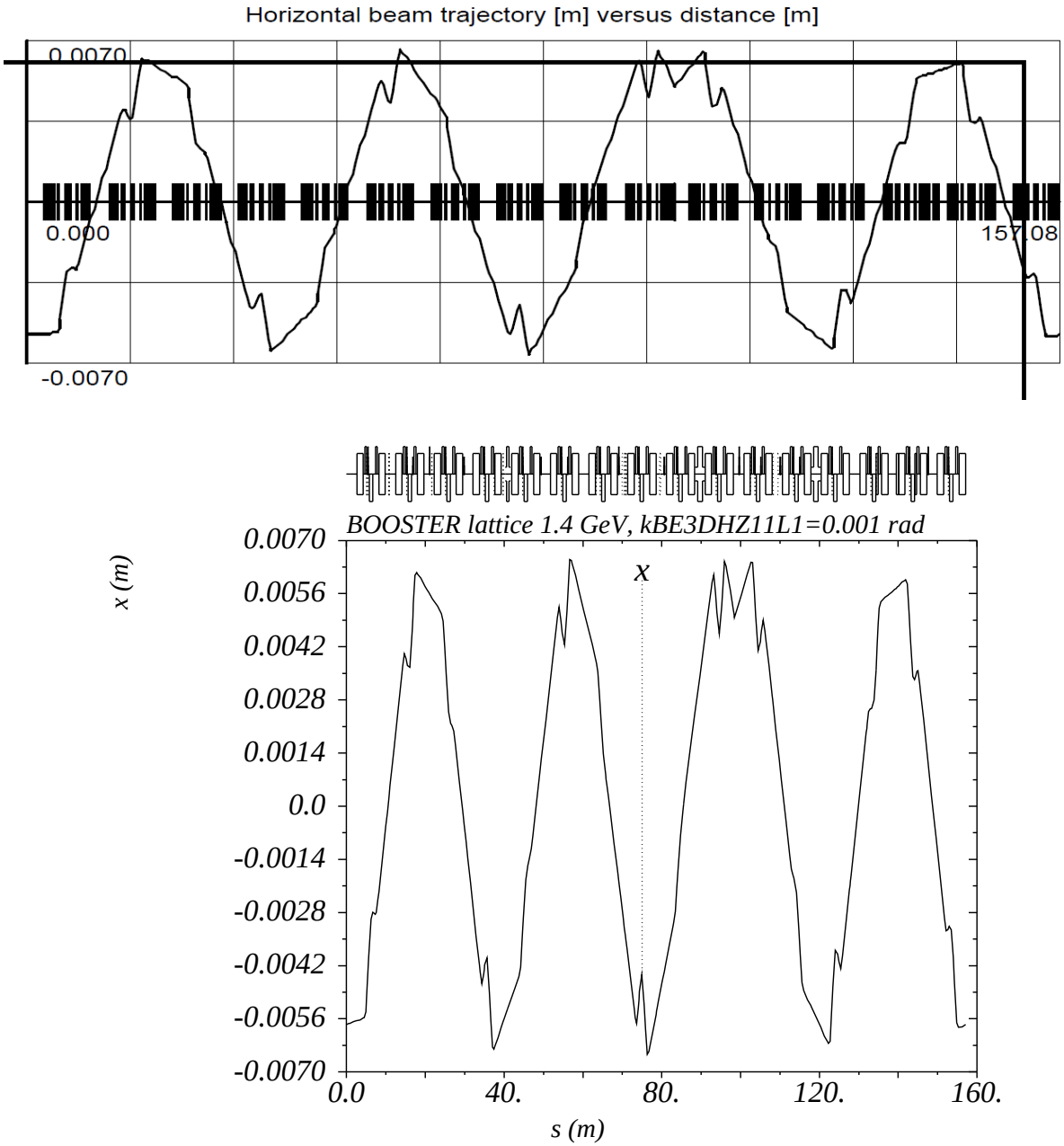

Figure 2: Closed Orbit comparison for a kick of 1 mrad for BE3.DHZ11L1. Top: from the note PS/OP/Note 99-xx of M. Benedikt. Bottom: Private MADX files

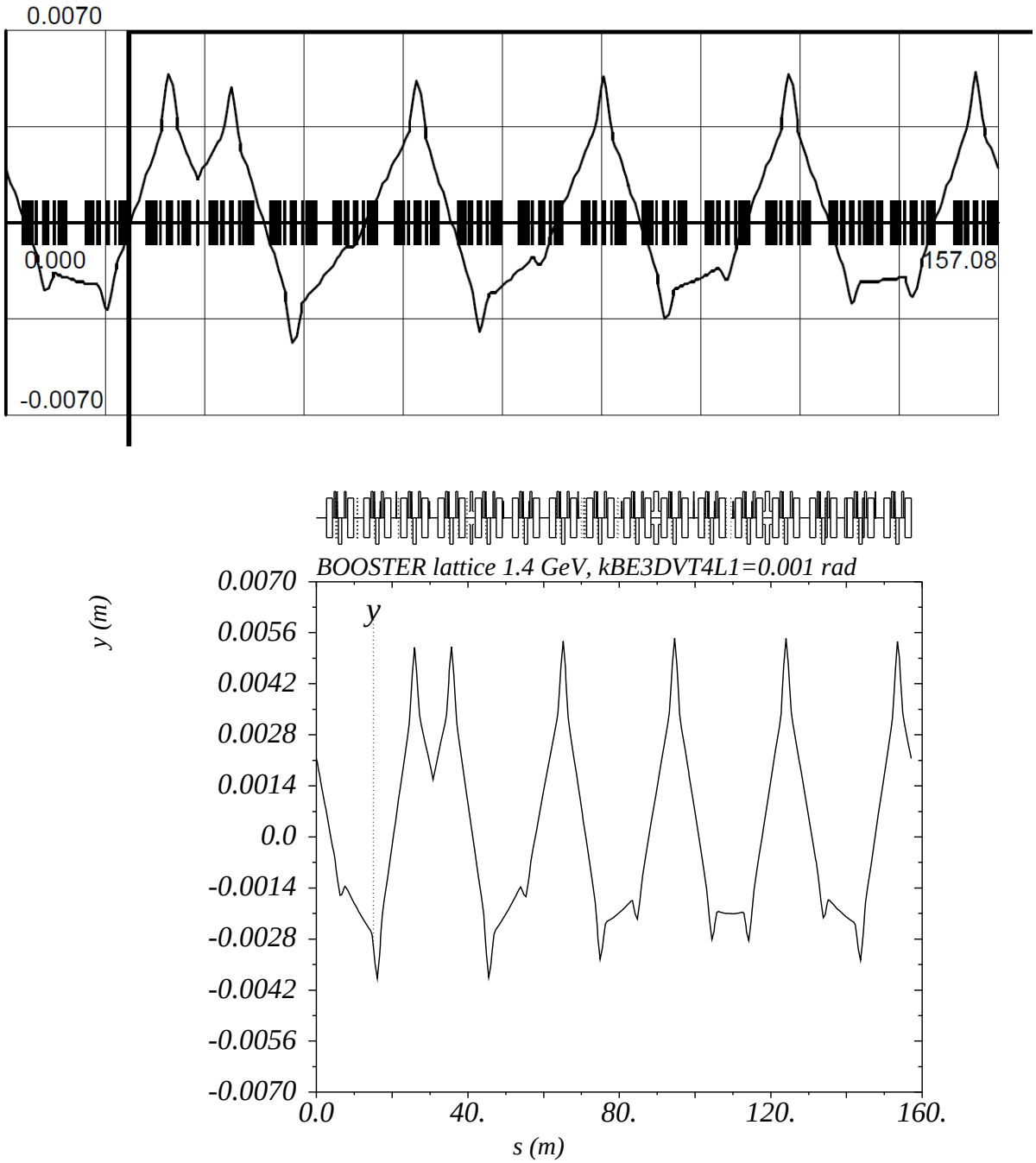

Figure 3: Closed Orbit comparison for a kick of 1 mrad for BE3.DVT4L1. Top: from the note PS/OP/Note 99-xx of M. Benedikt. Bottom: Private MADX files

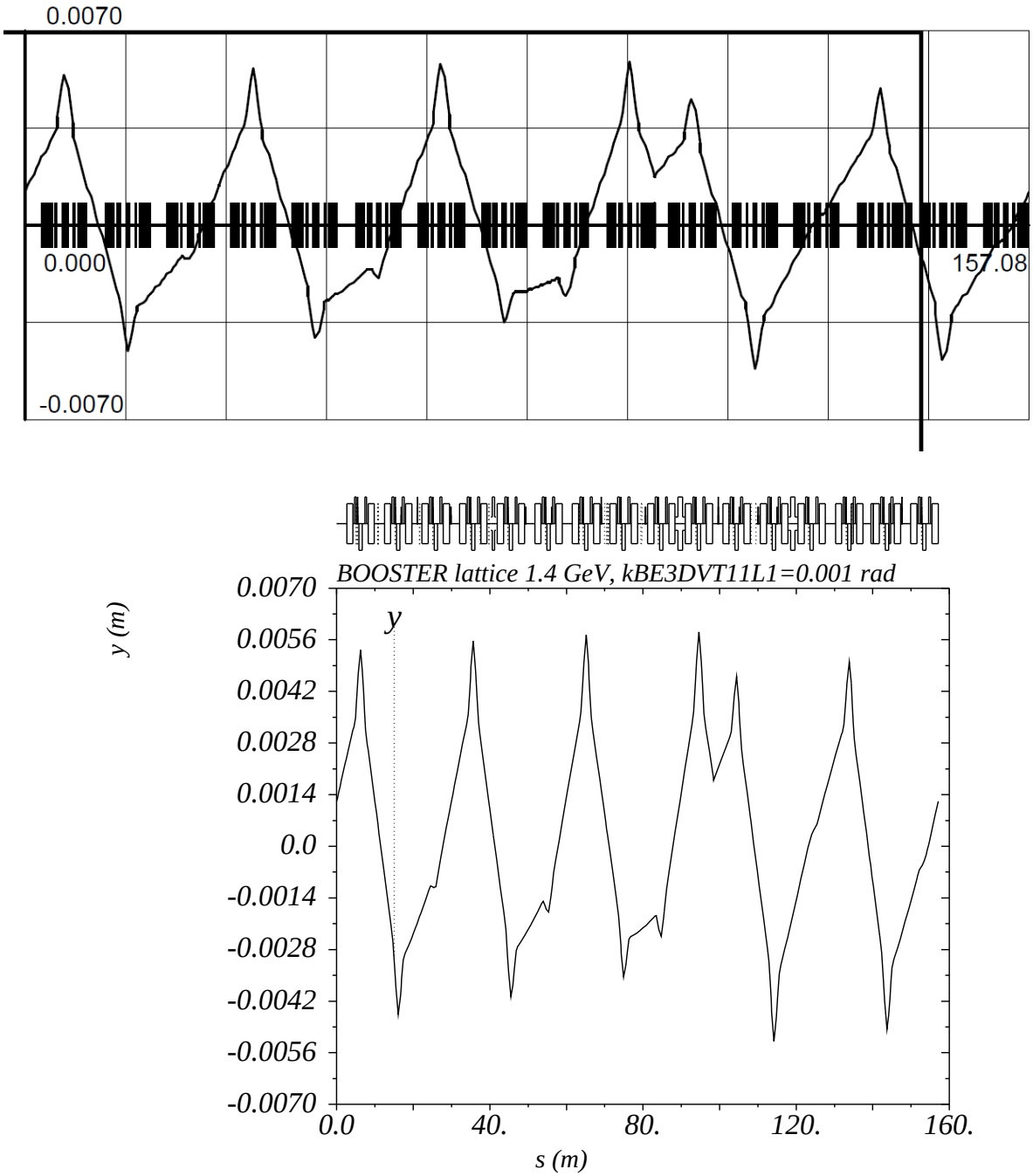

Figure 4: Closed Orbit comparison for a kick of 1 mrad for BE3.DVT11L1. Top: from the note PS/OP/Note 99-xx of M. Benedikt. Bottom: Private MADX files