

Beam Line Alignment

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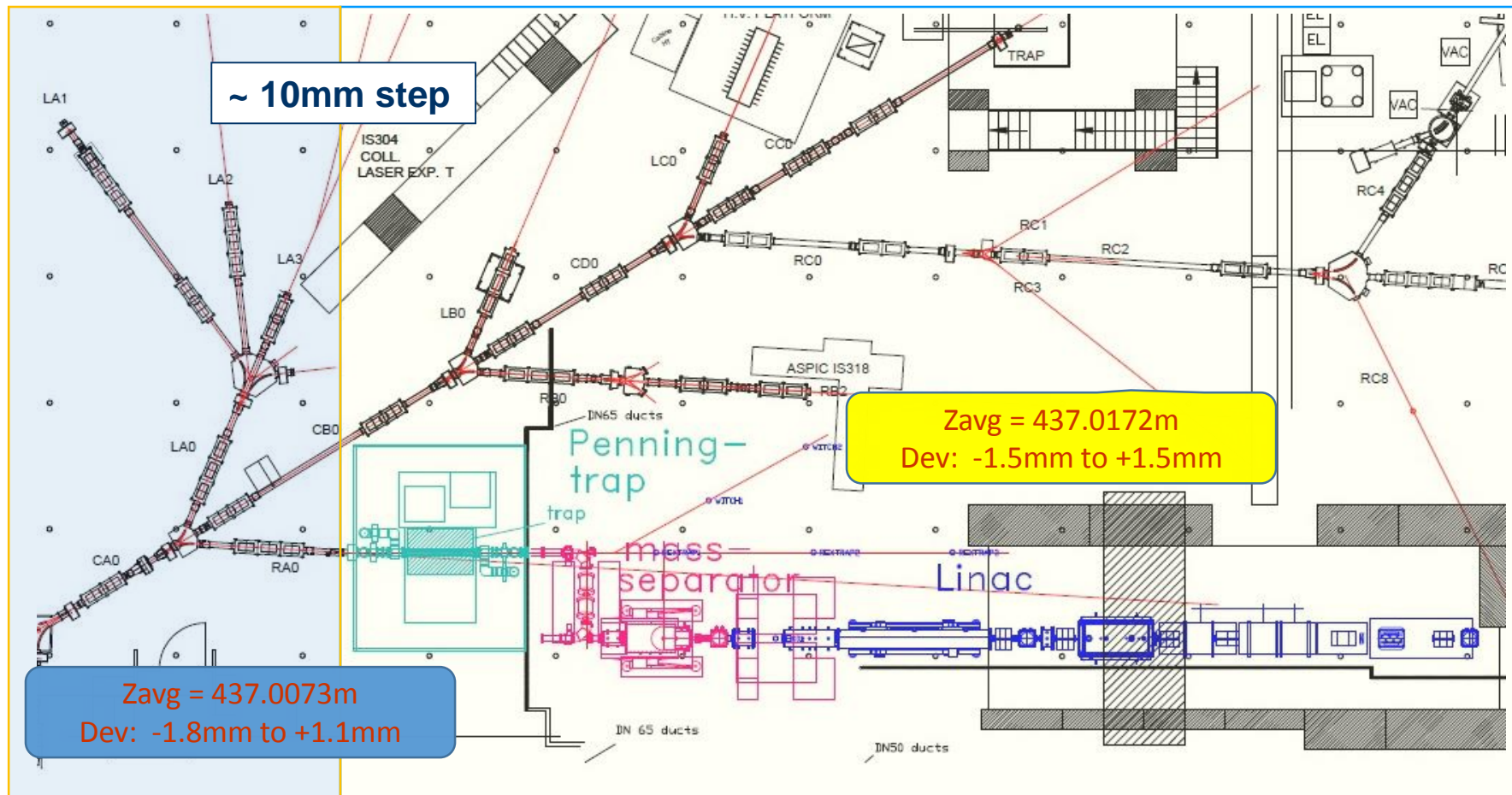


ISOLDE Lines - Survey Results

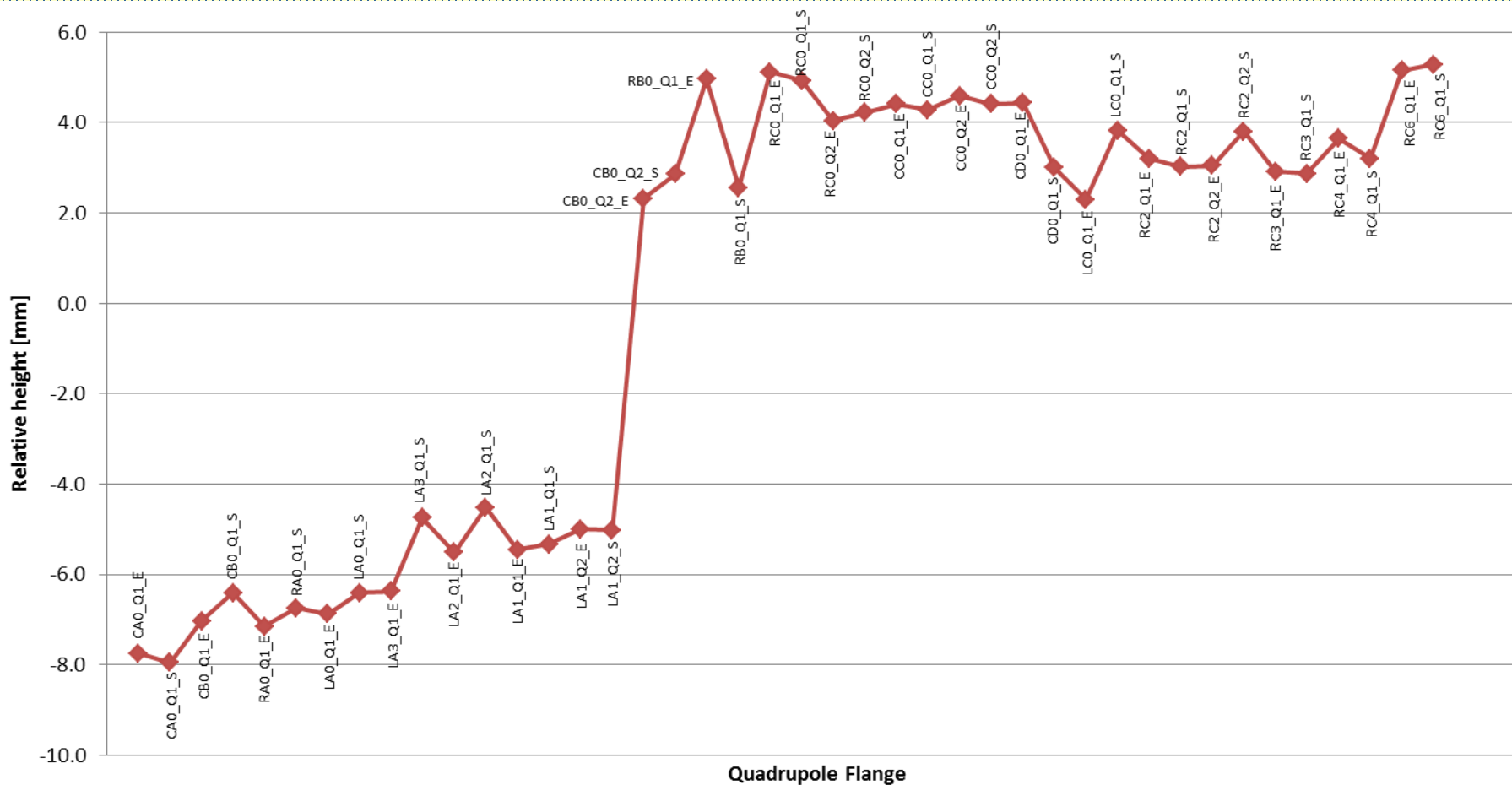
***Measurements of
November/December 2012***



RESULTS – vertical plane



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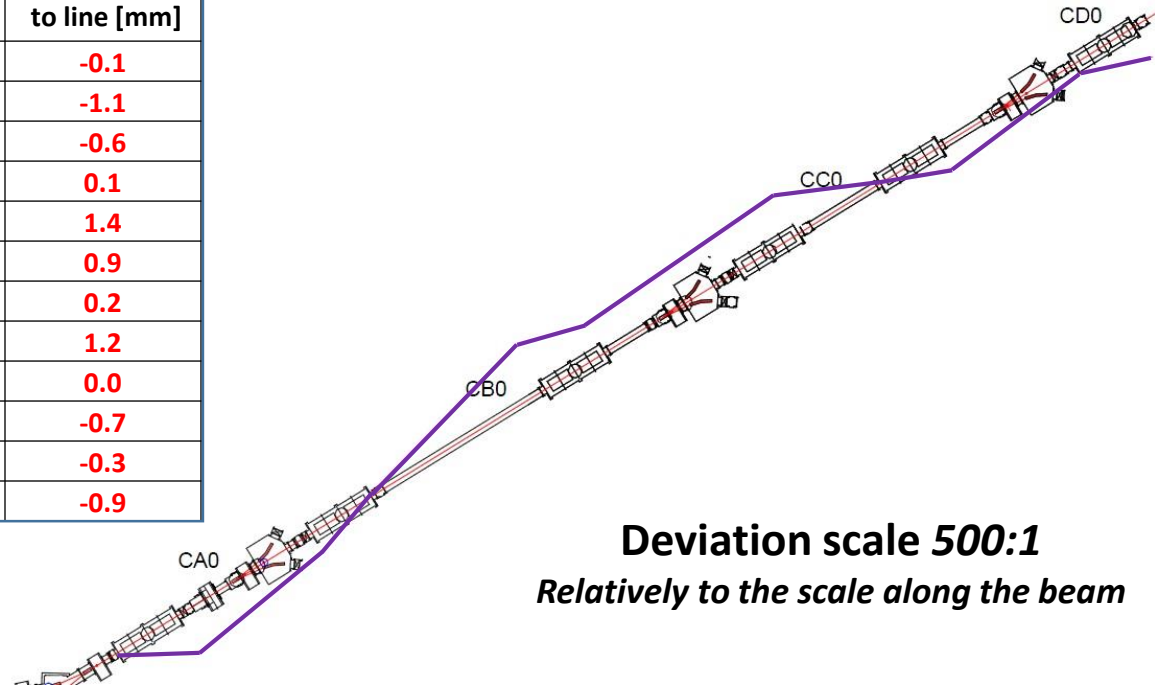
RESULTS – horizontal plane

main line CA0 – CD0



Line: **CA0-CB0-CC0-CD0** Bearing [g]: **351.4005**

Name	X [m]	Y [m]	Distance to line [mm]
CA0_Q_E	1879.3962	2239.1236	-0.1
CA0_Q_S	1878.7661	2239.7807	-1.1
CB0_Q1_E	1877.3575	2241.2535	-0.6
CB0_Q1_S	1876.7272	2241.9131	0.1
CB0_Q2_E	1874.9036	2243.8206	1.4
CB0_Q2_S	1874.2733	2244.4785	0.9
CC0_Q1_E	1872.8599	2245.9545	0.2
CC0_Q1_S	1872.2301	2246.6140	1.2
CC0_Q2_E	1871.3751	2247.5059	0.0
CC0_Q2_S	1870.7443	2248.1640	-0.7
CD0_Q1_E	1869.3341	2249.6383	-0.3
CD0_Q1_S	1868.3920	2250.6219	-0.9



Deviation scale 500:1
Relatively to the scale along the beam

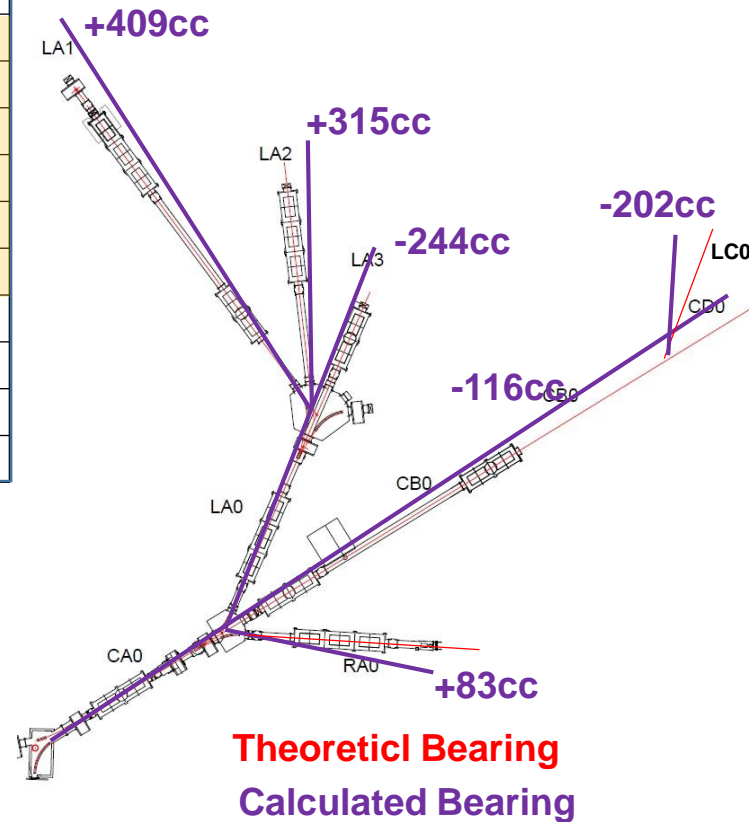
RESULTS – horizontal plane

bearings comparison

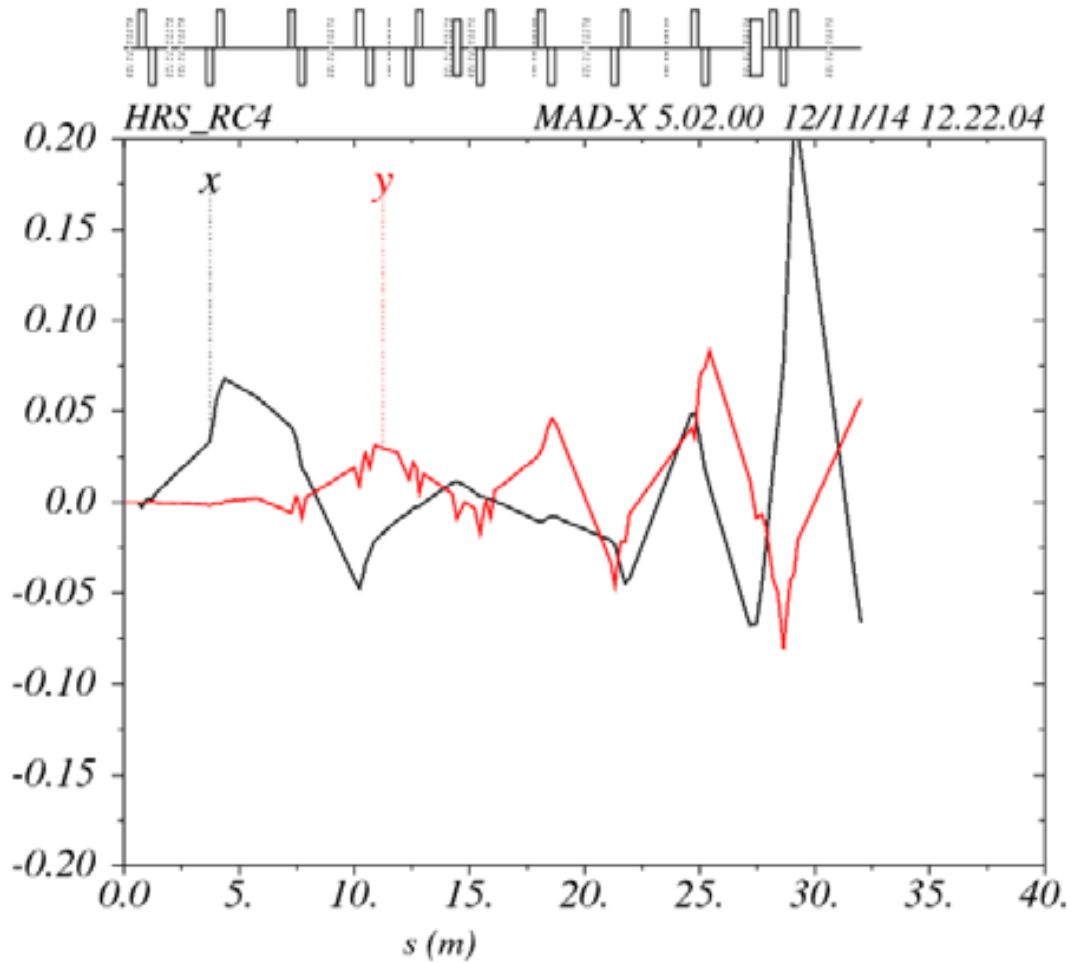


Line	Theoretical Bearing	Calculated Bearing	Difference Calc-Theo
	[g]	[g]	[cc]
CA0-CB0-CC0-CD0	351.4121	351.4005	-116
LA1	245.8565	245.8974	409
LA2	279.1898	279.2213	315
LA0-LA3	312.5232	312.4988	-244
LC0	312.5232	312.5030	-202
RA0	390.2997	390.3080	83
RB0	390.3010	390.2699	-311
RC0-RC2-RC6	390.3010	390.2941	-69
RC3	29.1899	29.1670	-229
RC4	323.6343	323.6108	-235

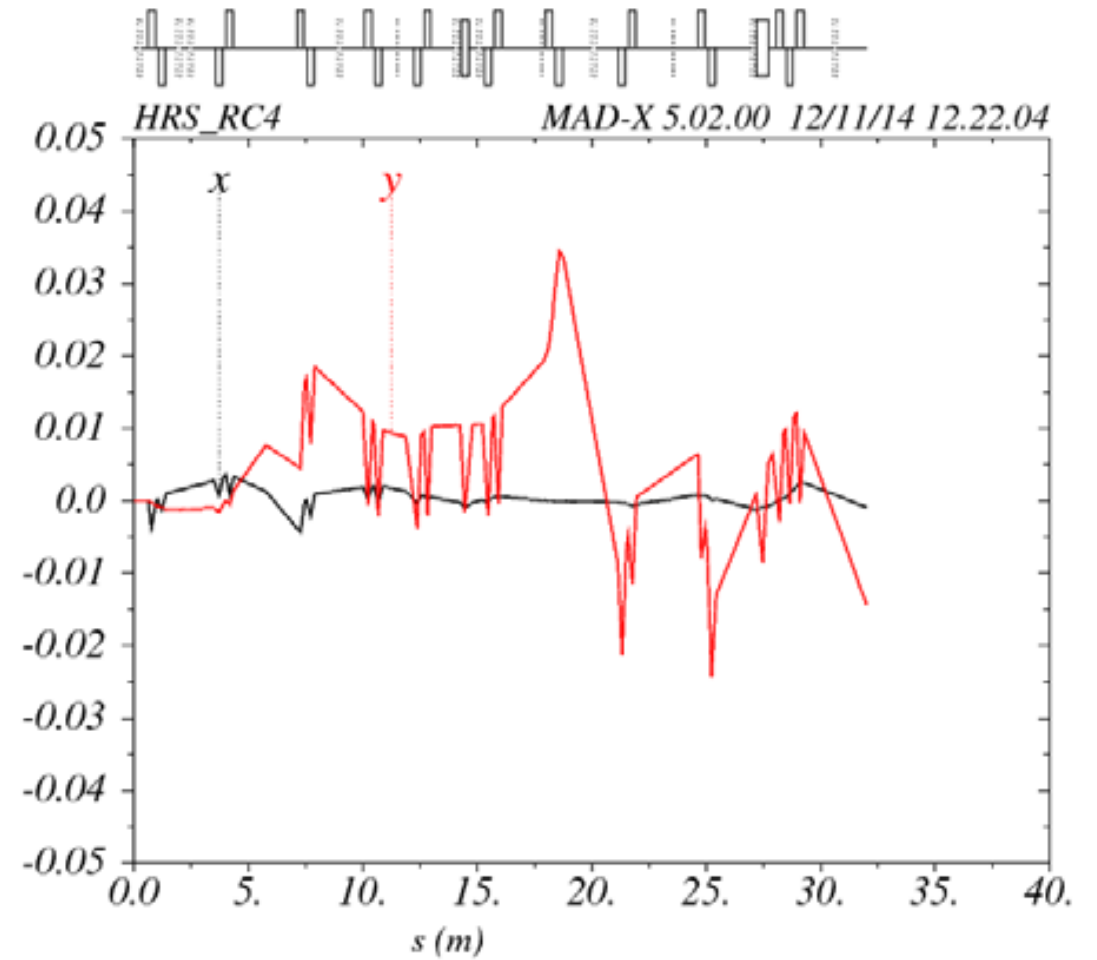
10cc ~ 0.16 mm/10m



MADX simulations



Distorted beam line without correction



Distorted beam line with correction

MADX simulations summary

- The result of this study shows that the transmission of the transfer lines can be recovered by using the correction power of the available steering quadrupoles.
- This is a rather fortunate situation because a misalignment in the horizontal direction would have been more difficult to handle due to the fact that the horizontal apertures of the elements are smaller.
- After tuning for 8 hours, one could achieve a transmission from CA0 to RC4 of around 80% to 90% (at 50kV).

Acceptance study of the ISOLDE beam lines with MAD-X

<https://edms.cern.ch/document/1688599/1>

E.Rapisarda, M.A. Fraser, J. Kurcewicz, D. Voulot