

# AUTOMATIC COLLIMATOR IMPEDANCE COMPUTATIONS

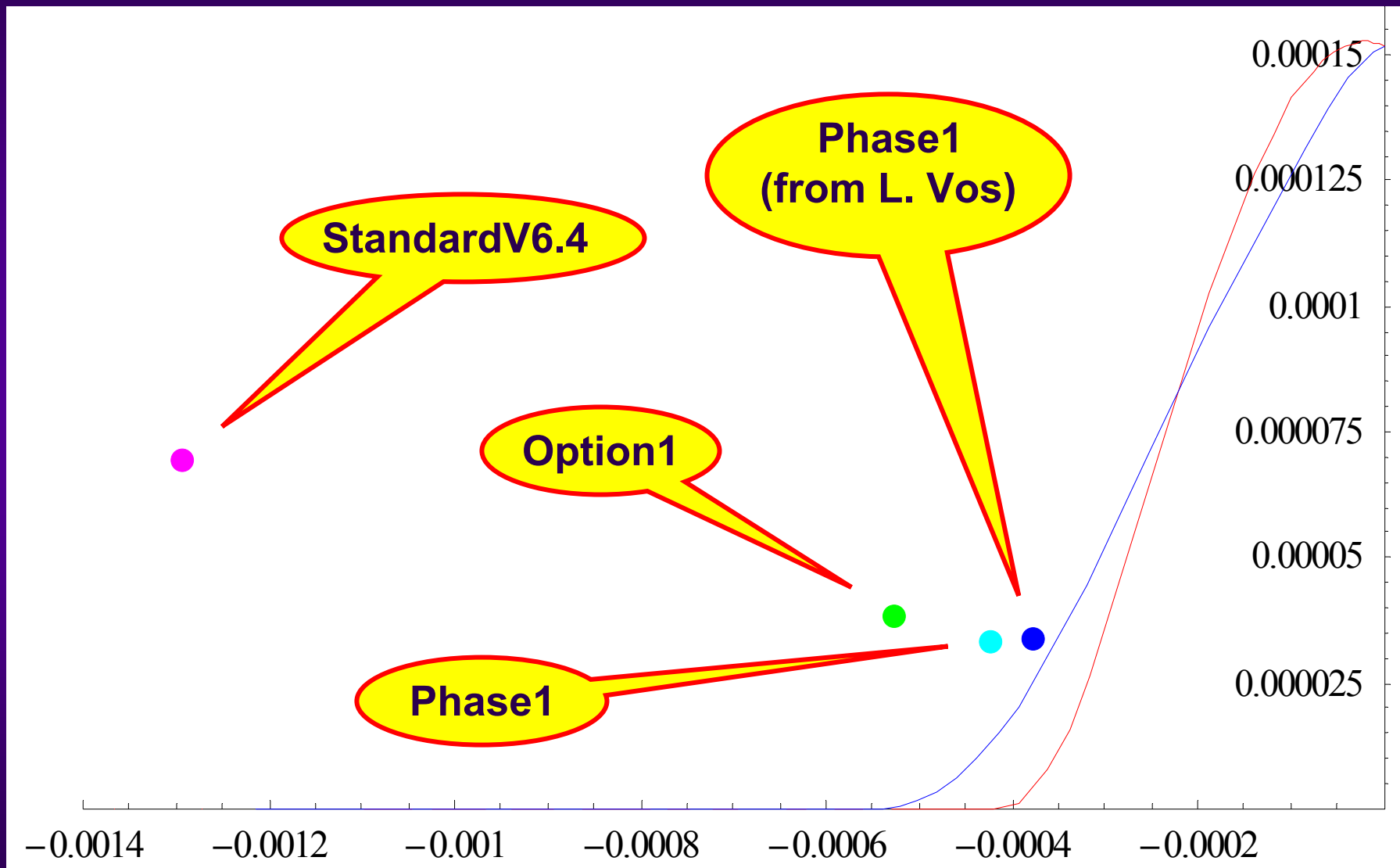
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- ◆ **Definition of the collimator orientation**
- ◆ **Stability diagram and tune shift for the 3 cases I know until now (un-coated graphite collimators) and comparison with L. Vos computations**
  - **“Phase1” = Baseline layout**
  - **“StandardV6.4”**
  - **“Option1”**

## Definition of the collimator orientation

- ◆ The angle given is between the x-axis and the direction perpendicular to the jaws (from L. Vos)  
  
⇒ There is a  $\text{Pi}/2$  with the angle I used for the last LCE presentation
- ◆ This problem has been solved

# Stability diagram (maximum octupoles) and collective tune shift for the most unstable coupled-bunch mode and head-tail mode 0 (1.1e11 p/b at 7 TeV)



# 3 Excel files for the moment (1/2)

## Phase 1

IR	Type	Name	Orientation (approx)	Angle [rad]	Material	Alternative material	Length	Setting [inj $\sigma$ ] inj optics	Setting [top $\sigma$ ] squeezed	Half gap [m] inj&ramp	Half gap [m] 7 TeV squeezed	Betax [m]	Betay [m]
3	prim	TCP.6L3.B1	H	0.000	C-C	n/a	0.2 m	8.0	15.0	0.00801	0.00380	128.23	160.36
	sec	TCS.5L3.B1	H	0.000	C-C	Al/Ti/C+Cu	1.0 m	9.3	18.0	0.00586	0.00287	50.79	336.44
	sec	TCS.A4R3.B1	H	3.063	C-C	Al/Ti/C+Cu	1.0 m	9.3	18.0	0.00425	0.00208	26.67	362.83
	sec	TCS.B4R3.B1	H	0.078	C-C	Al/Ti/C+Cu	1.0 m	9.3	18.0	0.00426	0.00209	26.84	359.91
	sec	TCS.A5R3.B1	H	0.155	C-C	Al/Ti/C+Cu	1.0 m	9.3	18.0	0.00493	0.00241	35.91	304.93
	sec	TCS.B5R3.B1	H	2.972	C-C	Al/Ti/C+Cu	1.0 m	9.3	18.0	0.00550	0.00269	44.76	275.83
	sec	TCS.C5R3.B1	H	0.156	C-C	Al/Ti/C+Cu	1.0 m	9.3	18.0	0.00610	0.00299	55.01	251.09
	7	prim	TCP.D6L7.B1	V	1.571	C-C	n/a	0.2 m	6.0	6.0	0.00664	0.00168	90.45
prim		TCP.C6L7.B1	H	0.000	C-C	n/a	0.2 m	6.0	6.0	0.00501	0.00127	89.13	158.74
prim		TCP.B6L7.B1	S	2.410	C-C	n/a	0.2 m	6.0	6.0	0.00582	0.00148	87.83	161.07
sec		TCS.A6L7.B1	H	2.919	C-C	n/a	1.0 m	7.0	10.5	0.00486	0.00185	48.45	320.00
sec		TCS.B5L7.B1	S	2.593	C-C	Al/Ti/C+Cu	1.0 m	7.0	10.5	0.00782	0.00298	126.54	248.46
sec		TCS.A5L7.B1	S	0.550	C-C	Al/Ti/C+Cu	1.0 m	7.0	10.5	0.00787	0.00299	131.25	241.96
sec		TCS.A4L7.B1	V	1.570	C-C	n/a	1.0 m	7.0	10.5	0.00515	0.00196	303.53	69.28
sec		TCS.A4R7.B1	H	0.371	C-C	n/a	1.0 m	7.0	10.5	0.00568	0.00216	66.92	198.29
sec		TCS.B4R7.B1	H	3.118	C-C	n/a	1.0 m	7.0	10.5	0.00496	0.00189	64.21	204.36
sec		TCS.C4R7.B1	V	1.381	C-C	n/a	1.0 m	7.0	10.5	0.00880	0.00335	63.01	207.27
sec		TCS.F4R7.B1	S	0.592	C-C	Al/Ti/C+Cu	1.0 m	7.0	10.5	0.00746	0.00284	66.17	319.92
sec		TCS.G4R7.B1	H	2.701	C-C	n/a	1.0 m	7.0	10.5	0.00660	0.00251	68.39	316.97
sec		TCS.A5R7.B1	V	1.611	C-C	n/a	1.0 m	7.0	10.5	0.00440	0.00168	362.63	50.10
sec		TCS.B5R7.B1	V	1.530	C-C	n/a	1.0 m	7.0	10.5	0.00442	0.00168	356.63	50.40

### 3 Excel files for the moment (2/2)

Collimator	Standard V6.4				Option 1				(90deg, equal beta, cold Q6)
	Angle [rad]	betax [m]	betay [m]	a [m]	Angle [rad]	betax [m]	betay [m]	a [m]	
TCP01	1.571 V	90.4467	156.436	0.001683	1.571 V	100.1398	132.7538	0.00155	
TCP02	0 H	89.1304	158.741	0.00127	0 H	98.68841	134.2914	0.001337	
TCP03	2.41 S	87.8347	161.069	0.001477	2.35619 S	97.25751	135.8453	0.001453	
TCP04	0.732 S	86.5595	163.419	0.00148	0.7854 S	95.84707	137.4153	0.001453	
TCS01	0.002 H	50.6859	290.865	0.001118	1.571 V	103.1845	202.9513	0.002237	
TCS02	0.184 H	48.7318	314.911	0.001192	0 H	116.4539	189.6782	0.001694	
TCS03	2.919 H	48.4524	319.999	0.001233	2.35619 S	130.8177	177.017	0.001948	
TCS04	2.593 S	126.537	248.459	0.001984	0.7854 S	146.276	164.9678	0.001958	
TCS05	0.55 S	131.247	241.964	0.001995	1.571 V	253.7377	144.308	0.001886	
TCS06	1.569 V	327.641	84.2125	0.001441	0 H	239.6372	155.5171	0.00243	
TCS07	1.57 V	303.528	69.2811	0.001307	2.35619 S	226.0695	167.3591	0.002202	
TCS08	0.3707 H	66.9155	198.287	0.00144	0.7854 S	213.0347	179.8339	0.0022	
TCS09	3.118 H	204.356	64.2144	0.001259	1.571 V	153.7757	236.3401	0.002414	
TCS10	1.381 V	63.0066	207.268	0.002232	0 H	164.8921	217.3243	0.002016	
TCS11	2.768 S	61.8417	210.21	0.001418	2.35619 S	176.5972	199.2472	0.002152	
TCS12	3.1415 H	49.8287	255.915	0.001108	0.7854 S	188.8913	182.1087	0.002138	
TCS13	0.592 S	66.1682	319.922	0.001892	1.571 V	155.8329	103.6856	0.001599	
TCS14	2.701 H	68.3897	316.965	0.001673	0 H	143.8605	110.6407	0.001883	
TCS15	1.611 V	362.633	50.1045	0.001117	2.35619 S	132.5803	118.1204	0.001758	
TCS16	1.53 V	356.627	50.395	0.00112	0.7854 S	121.9924	126.1247	0.001749	

$$\rho \approx 14 \times 10^{-6} \Omega \text{m}$$

$$l_P = 0.2 \text{ m}$$

$$l_S = 1 \text{ m}$$