

CERN

European Organization for Nuclear Research

Organisation Européenne pour la Recherche Nucléaire

LHC Collimator Phase Coverage

Thanks to Delphine Jacquet



Content

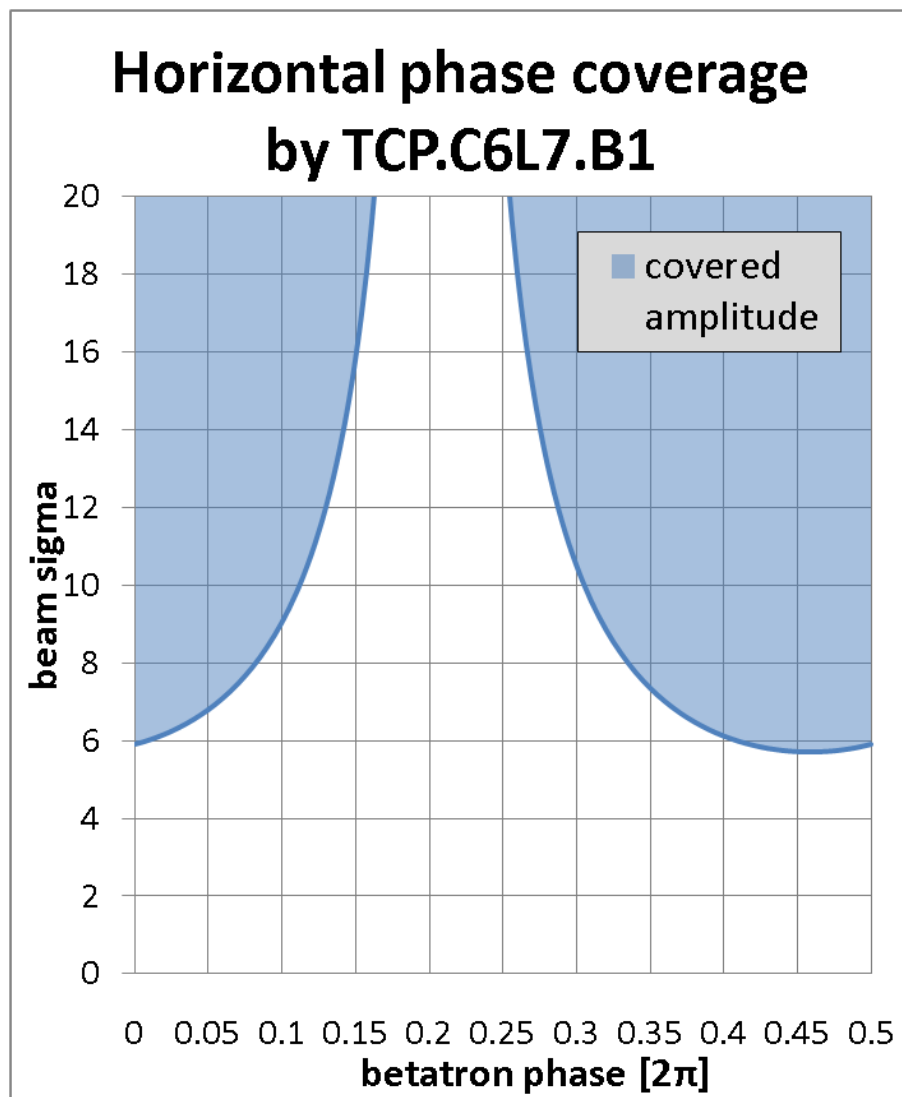
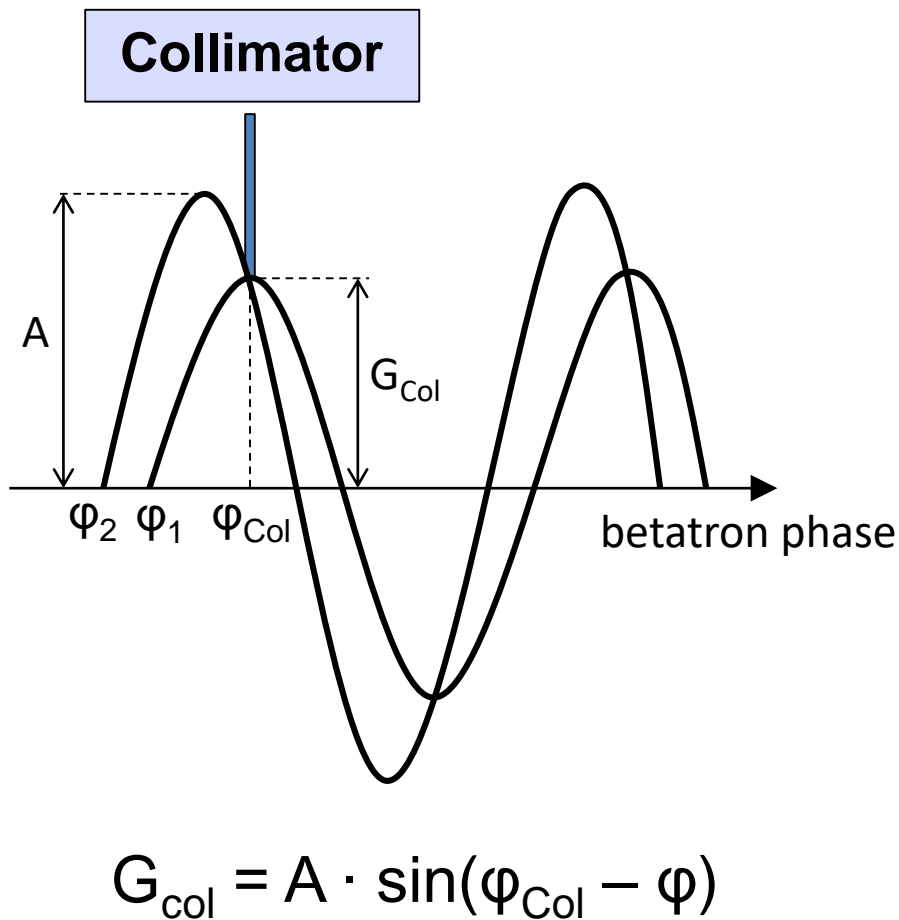
1. Introduction
2. Phase coverage throughout LHC cycle
3. Summary



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Collimator Phase Coverage



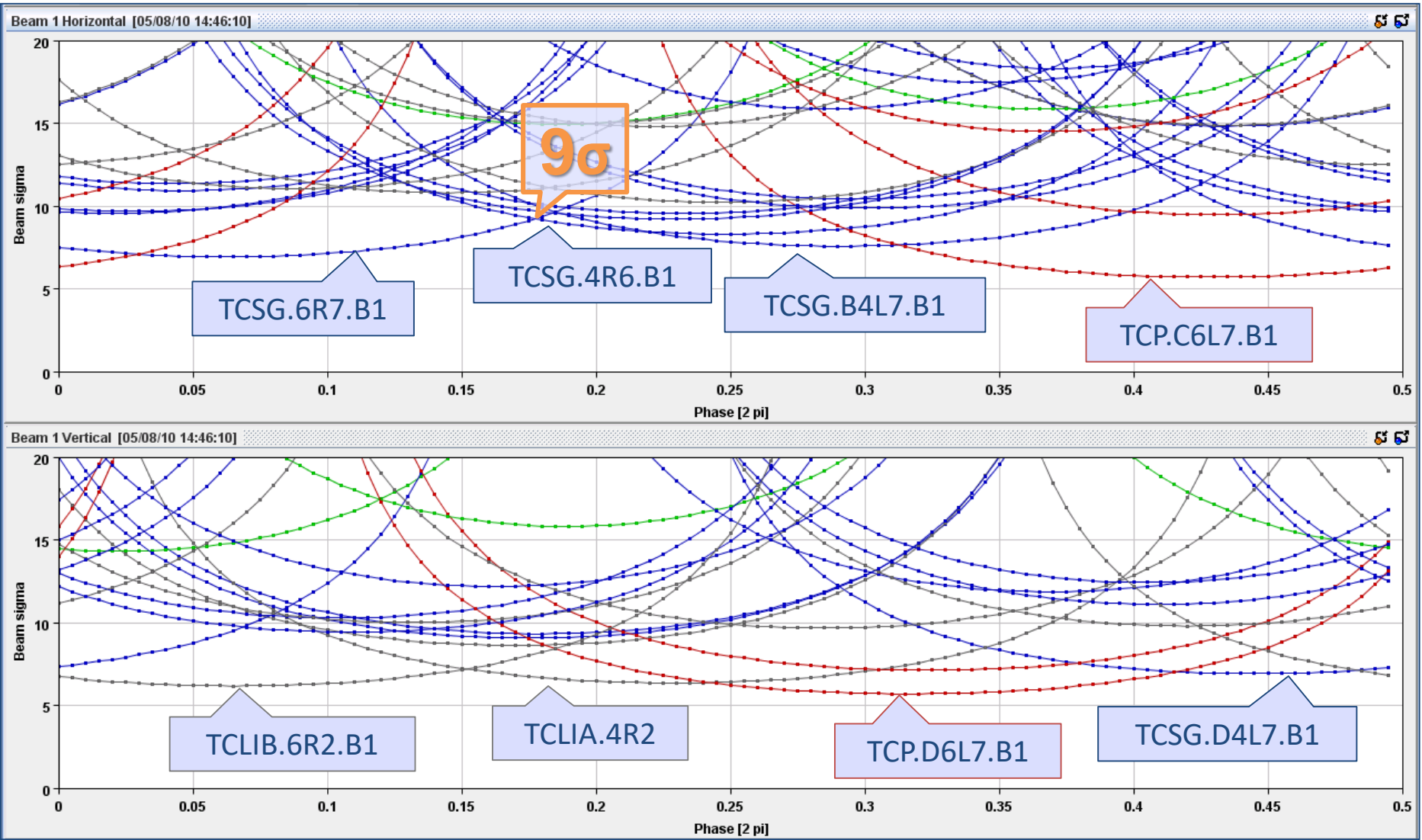


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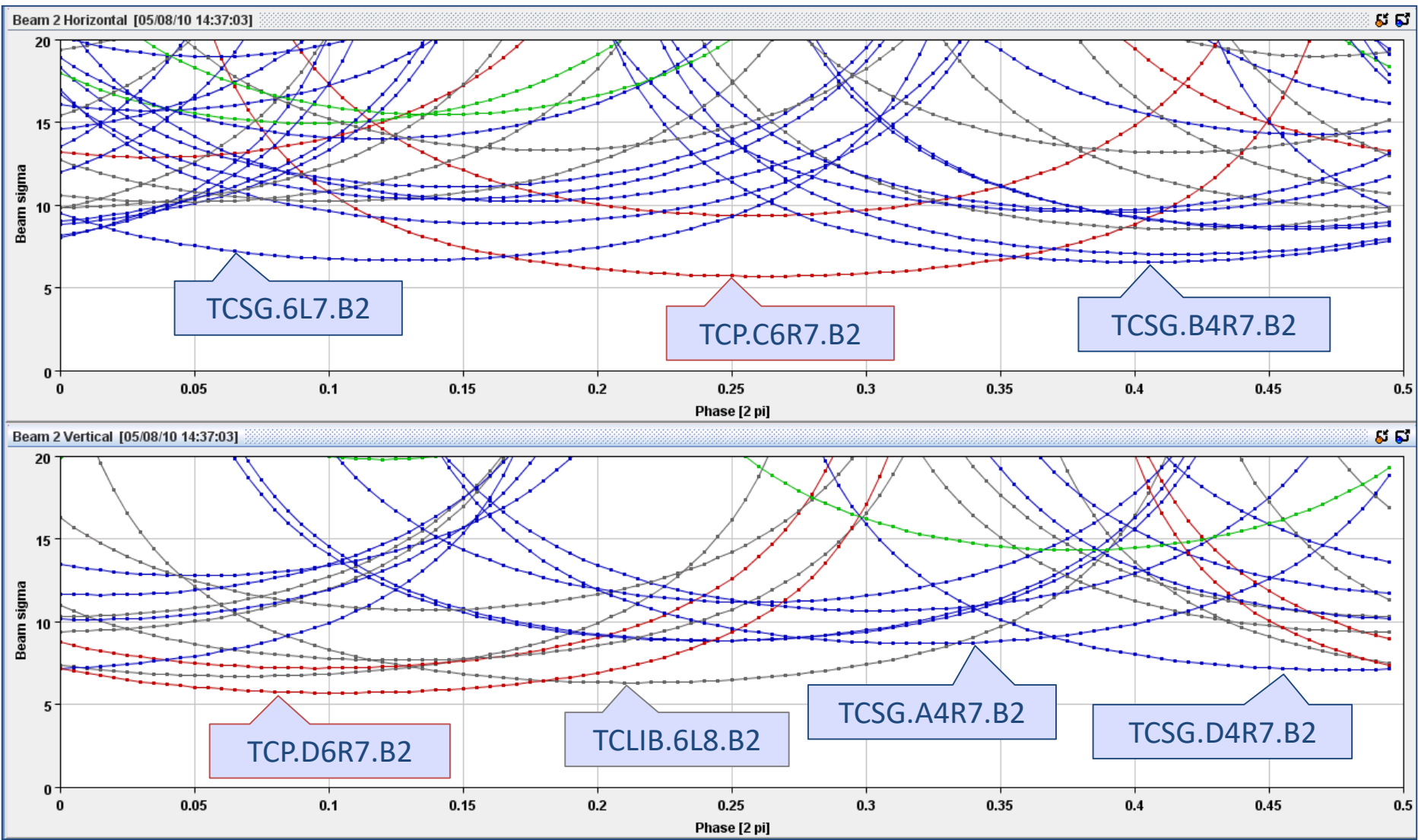


Injection B1



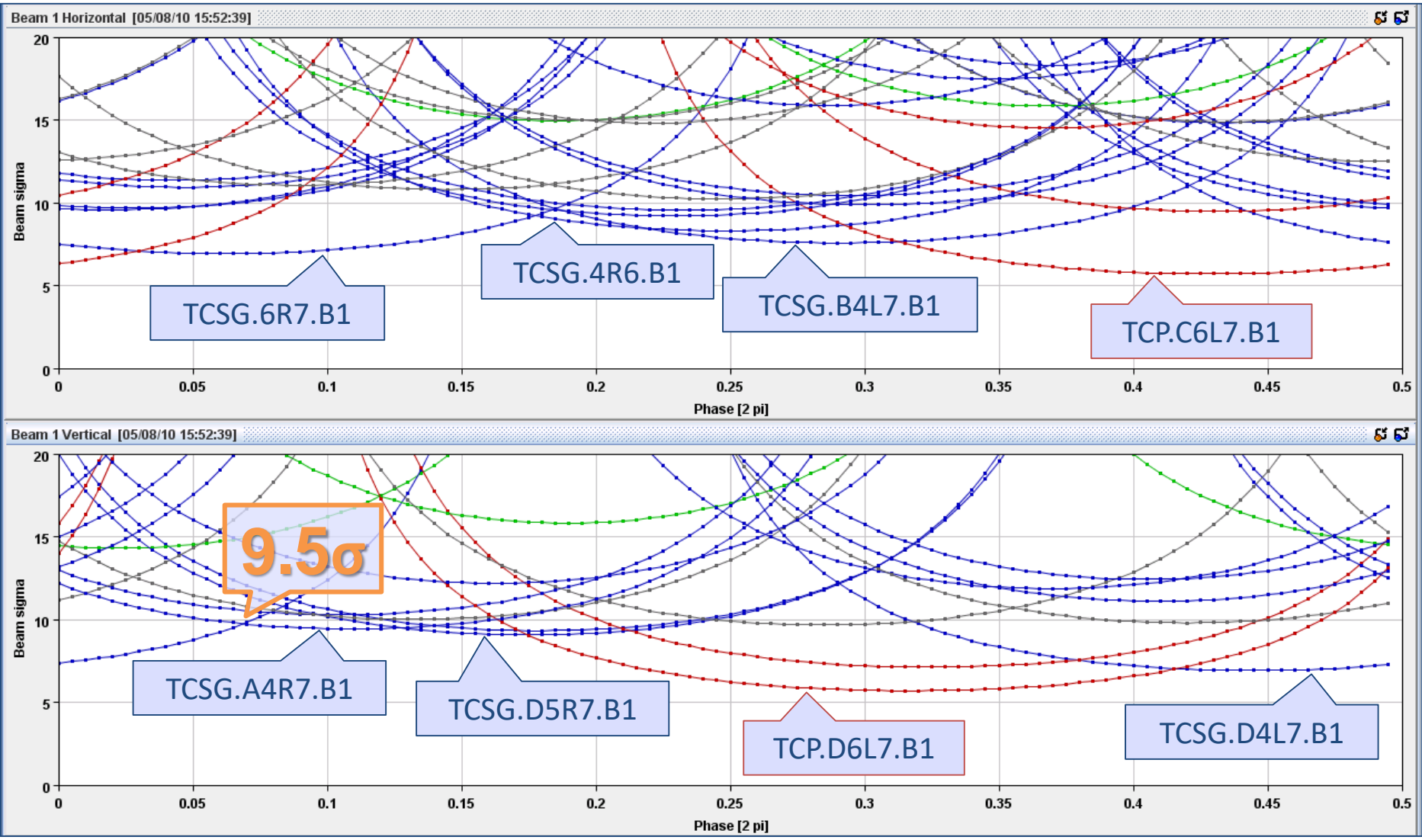


Injection B2



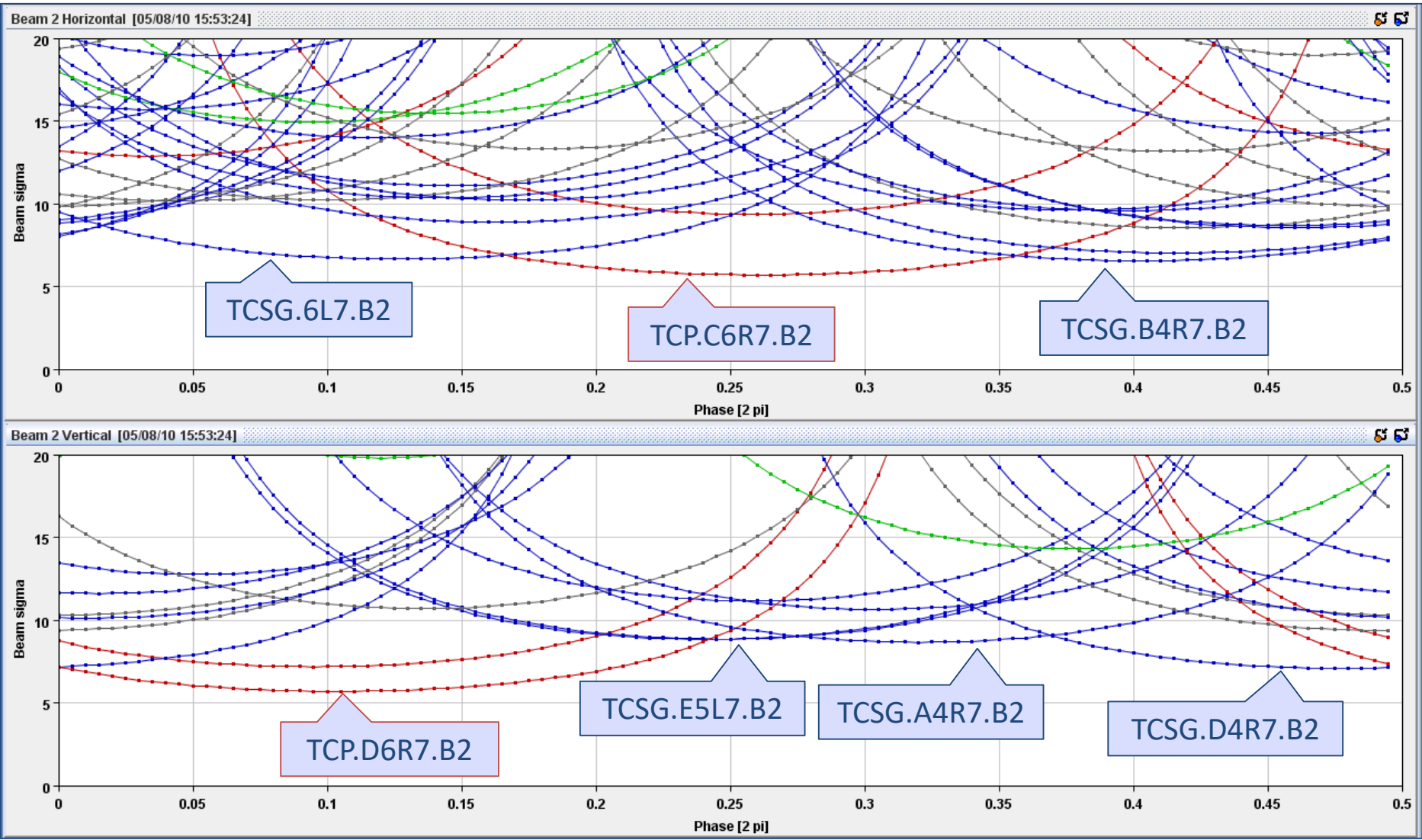


After Injection B1



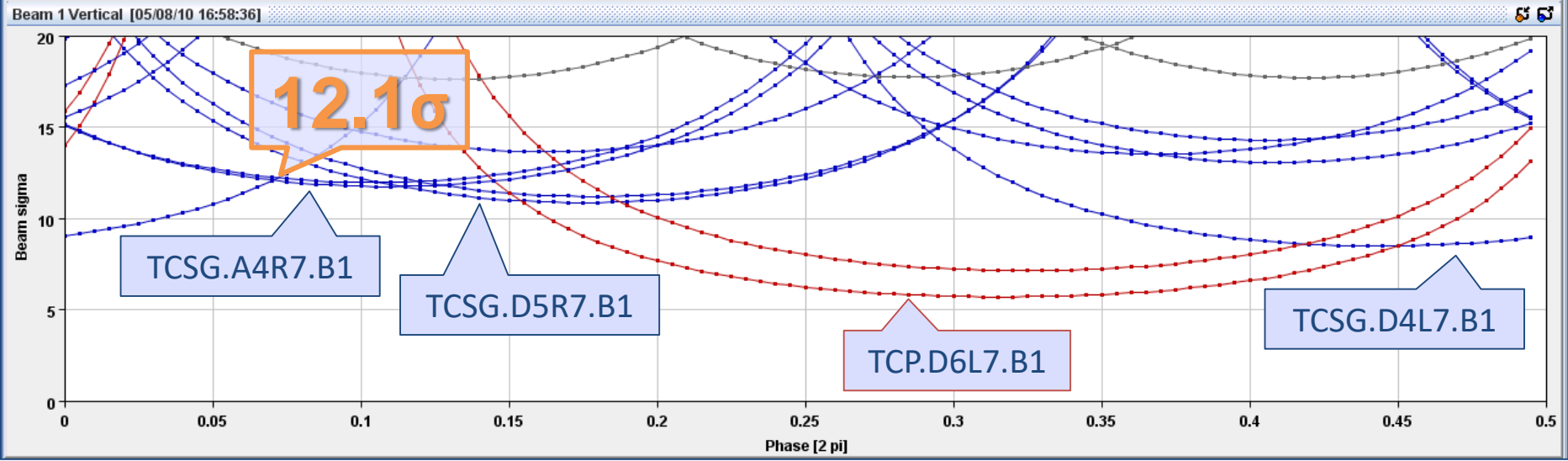
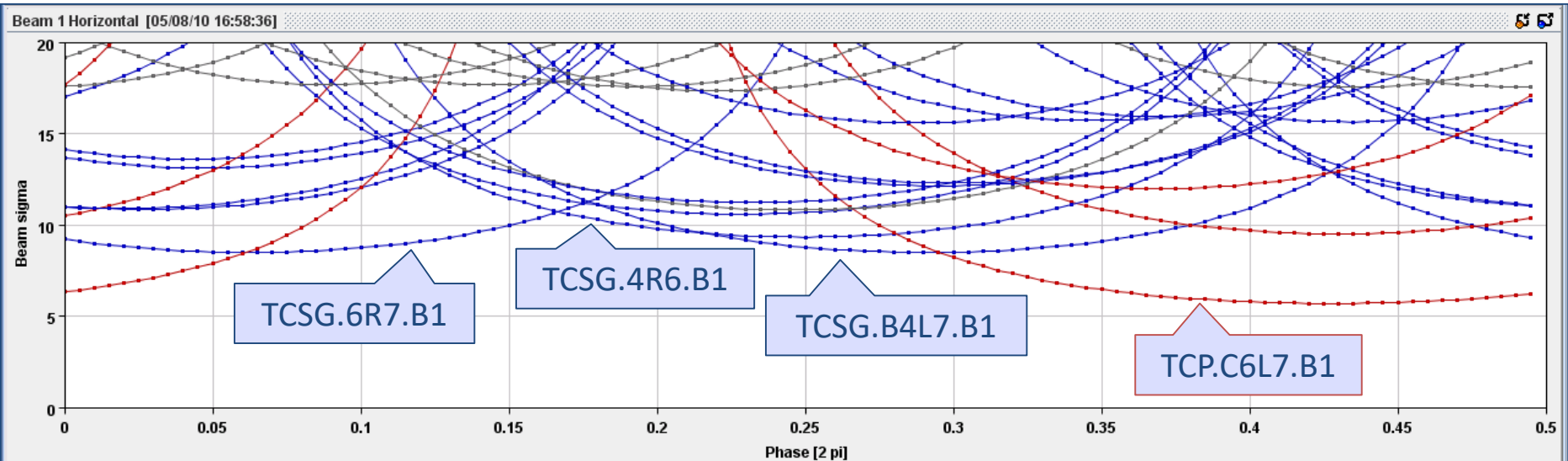


After injection B2



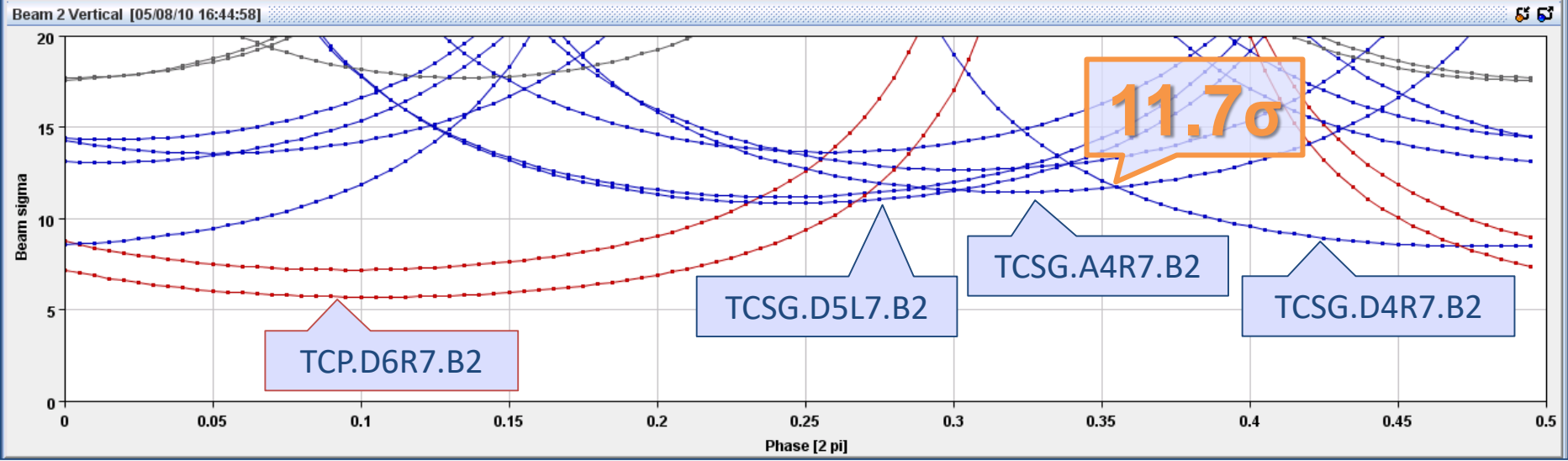
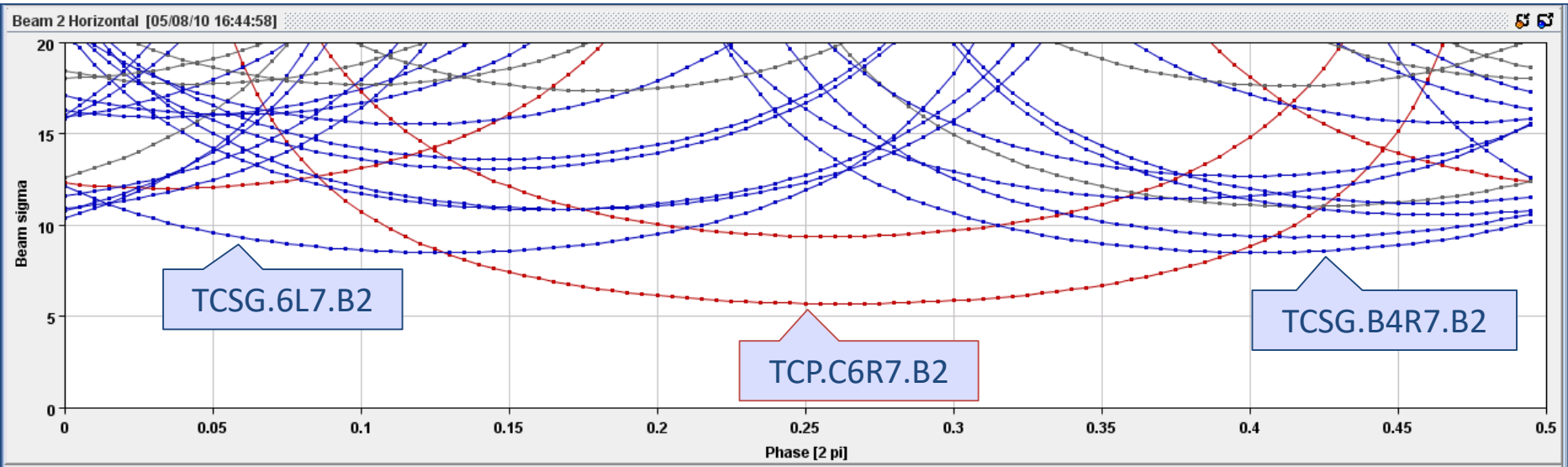


3.5 TeV, $\beta^*=11$ m B1



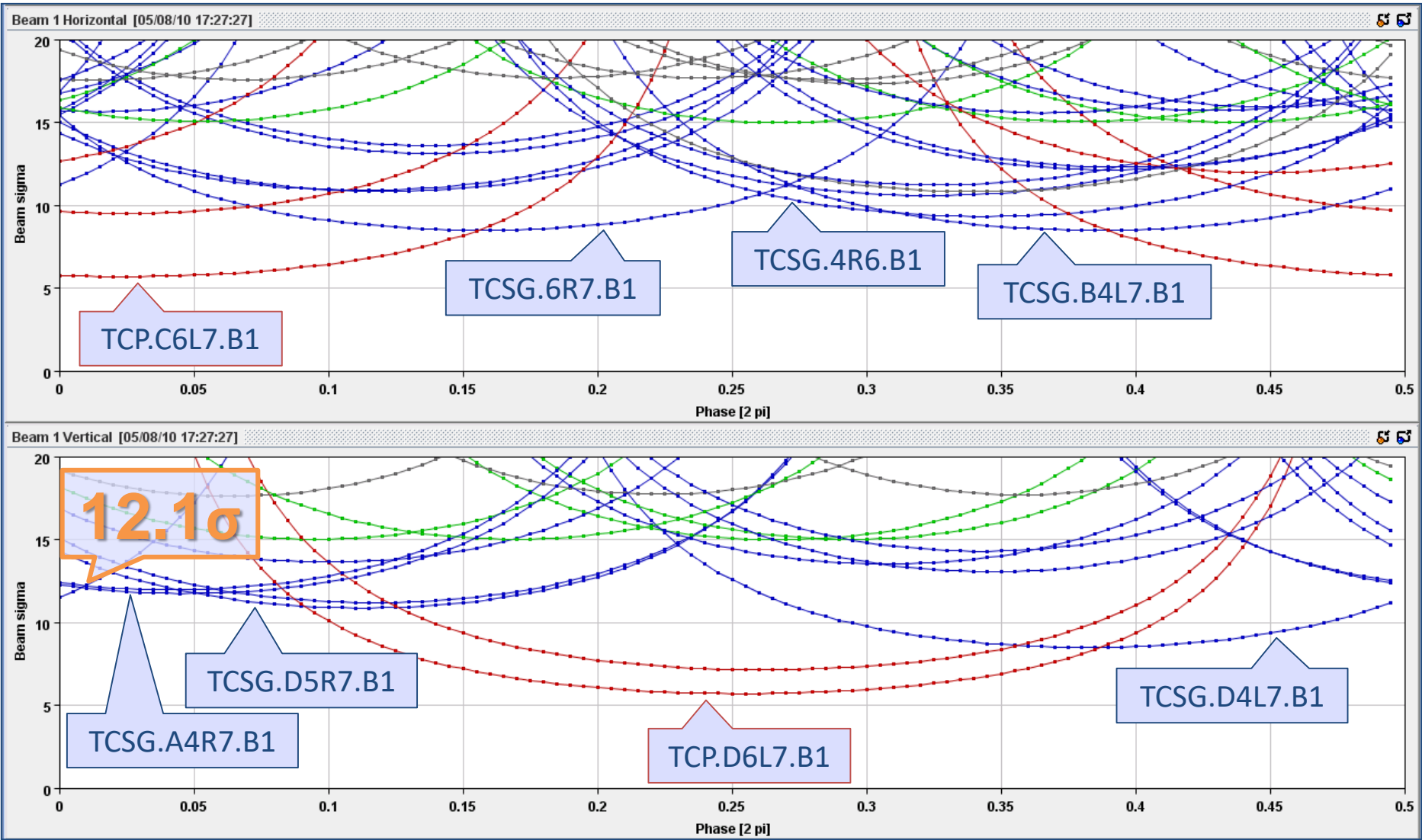


3.5 TeV, $\beta^*=11$ m B2



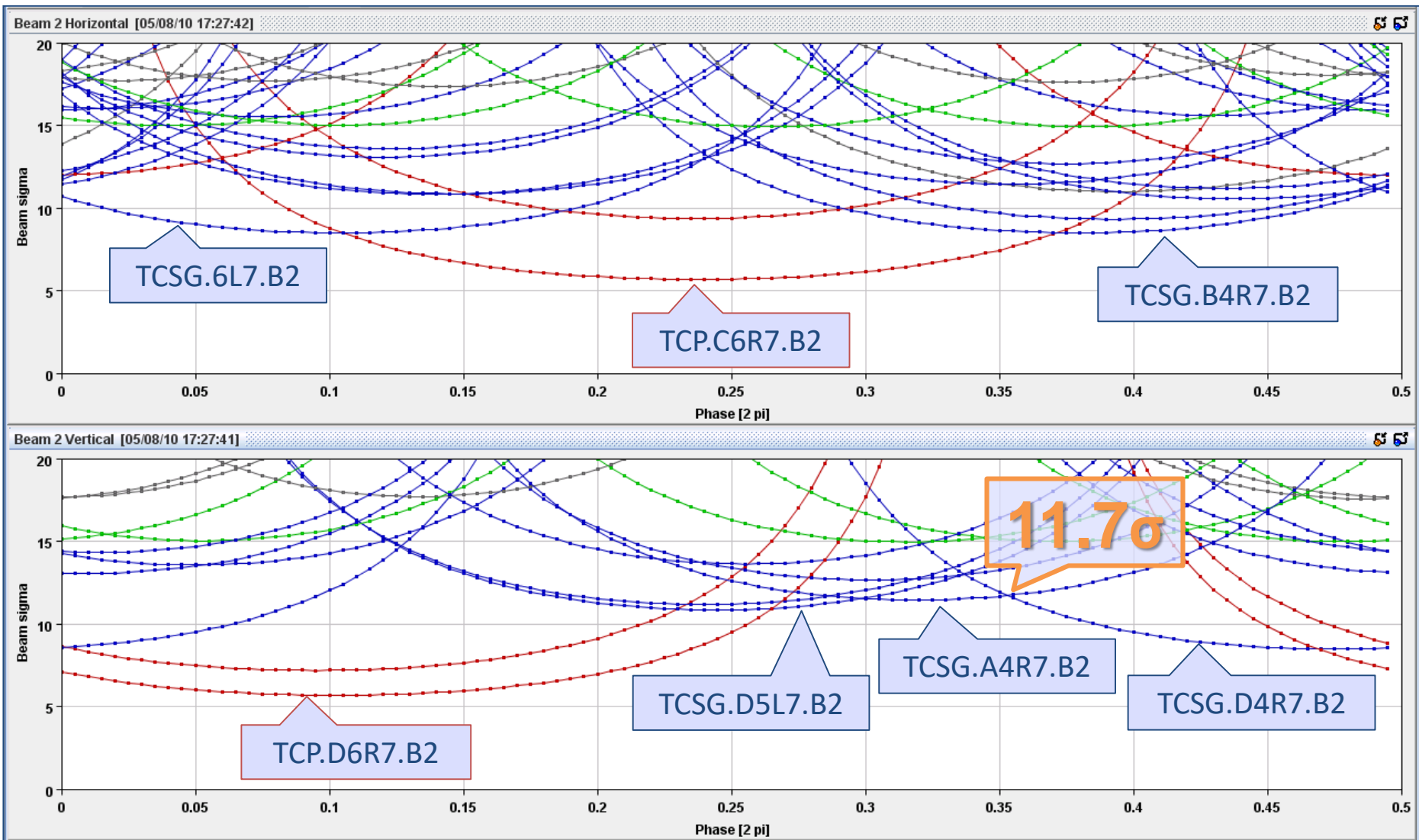


3.5 TeV, $\beta^*=3.5$ m B1





3.5 TeV, $\beta^*=3.5$ m B2



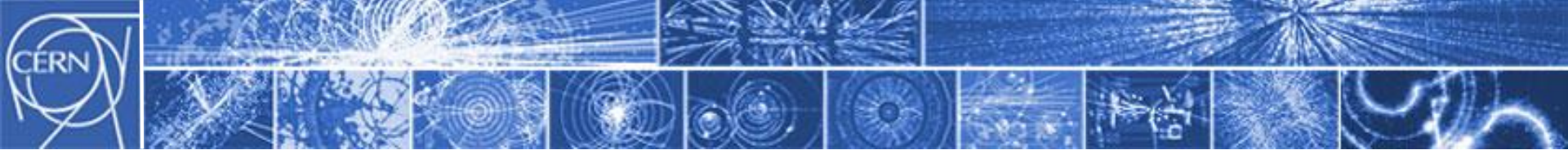


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Summary

- Total coverage by **TCPs** and **TCSGs** in IP7, **TCSG.4R6.B1** (B1 H) and **TCLI** in IP2 and IP8
- **Injection**: Max uncovered amplitude: $\approx 9\sigma$ (B1 H, B2 H)
- **After injection**: Max uncovered amplitude: $\approx 9.5\sigma$ (B1 V)
- **Flat Top**: Max uncovered amplitude: 10.7σ (B1 H), **12.1σ (B1 V)**,
 11.1σ (B2 H), 11.7σ (B2 V)
- **Squeeze (3.5m)**: only phase changes relative to flat top



Thank you for your Attention

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- Based on Delphine Jacquet's collimator application.
- Assuming $\varepsilon_n = 3.5 \mu\text{m rad}$.
- Collimator positions are acquired from HW, β and tune from LSA optics.
- For skewed collimators the effective gap in the center of the horizontal/vertical plane is taken into account.
- Color coding: **TCP**, **TCSG**, **TCT**, **Other**.



Betatron phases

Beam 1:

	Horizontal		Vertical	
	Injection	Collision	Injection	Collision
MKI	X	X	0.148 – 0.196	X
MKD	0.731 – 0.743	0.826 – 0.837	X	X
ADT	0.156 – 0.160	0.235 – 0.239	0.325 – 0.331	0.257 – 0.263

Beam 2:

	Horizontal		Vertical	
	Injection	Collision	Injection	Collision
MKI	X	X	0.100 – 0.136	X
MKD	0.923 – 0.934	0.900 – 0.911	X	X
ADT	0.156 – 0.160	0.117 – 0.122	0.431 – 0.434	0.424 – 0.427