

Lobster Measurements

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What was the MD about

New IR7 optics for increased cleaning performance and impedance

- with HL-LHC intensities concerns that dispersion suppressor quench limits might be exceeded
- plan: install 11T dipoles and new collimators
- no 11T dipoles, so no new collimators got installed
- new proposition: high β function at primary collimators (which improves their cleaning performance)

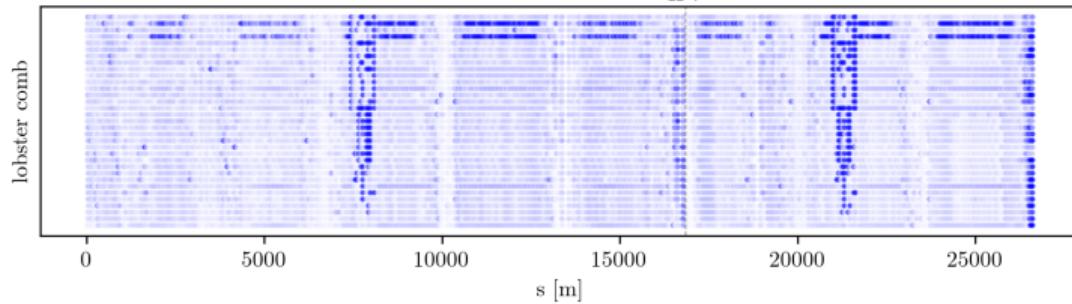
Additional benefit:

- lower impedance through higher β function

IR7 new optics MD

Model with warm trims – cmin: 1e-06, cmax: 1.0, cgamma: 0.4

IP7

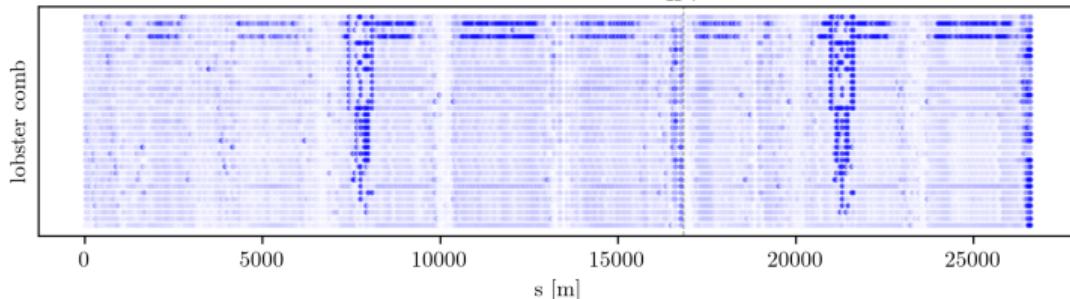


- 60% peak β beating in B1 and 80% in B2
- performed SbS \rightarrow trim in warm Q4/5 not applied
 - reproducing missing trim in Q4/5 brings β beating down

IR7 new optics MD

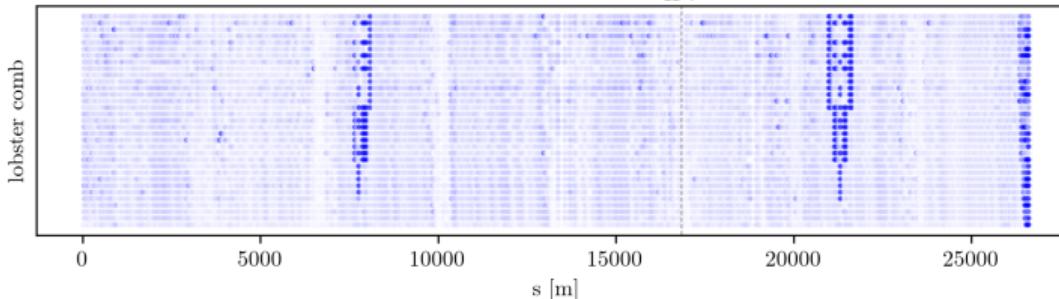
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IP7



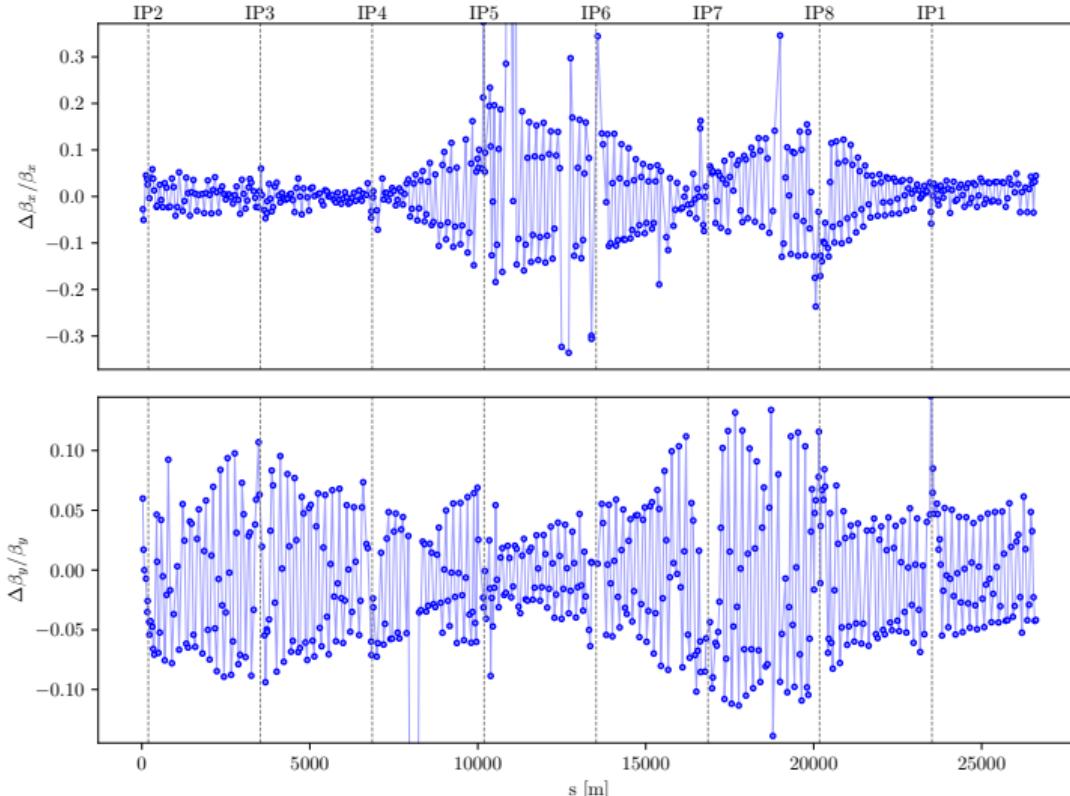
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IP7



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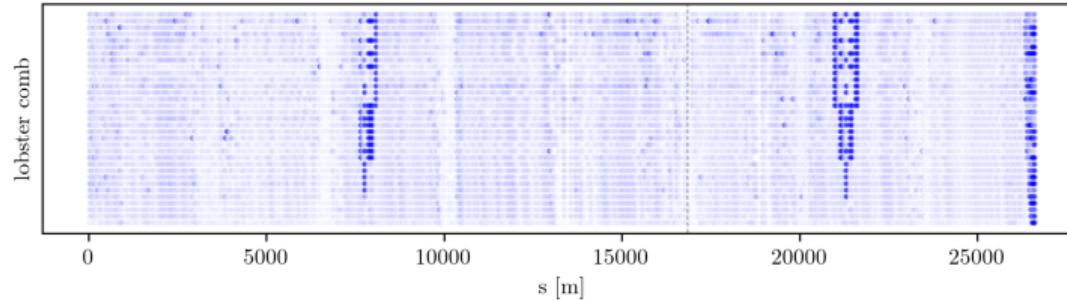


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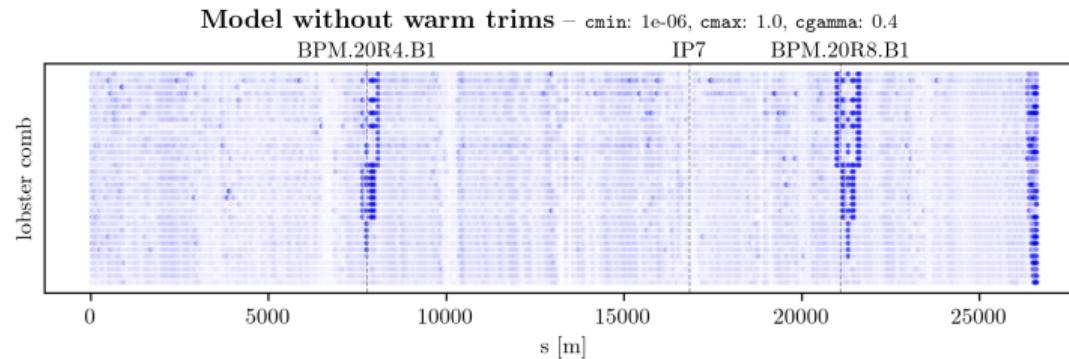
Including Arc Bumps

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IP7

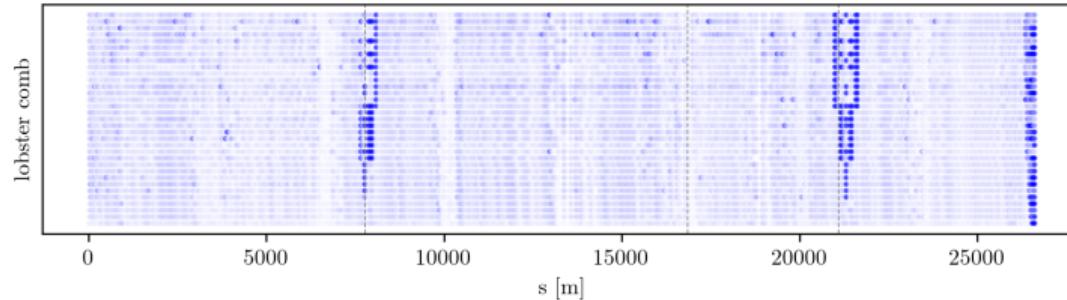


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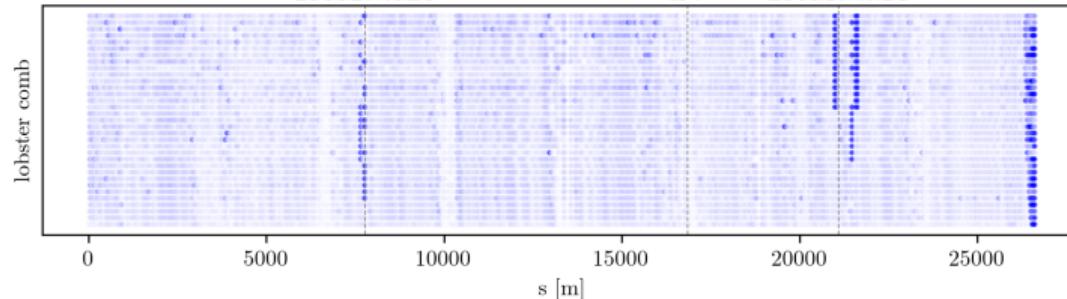


Including Arc Bumps

Model without warm trims – cmin: 1e-06, cmax: 1.0, cgamma: 0.4
BPM.20R4.B1 IP7 BPM.20R8.B1



ArcKnob at 1.0 – cmin: 1e-06, cmax: 1.0, cgamma: 0.4
BPM.20R4.B1 IP7 BPM.20R8.B1



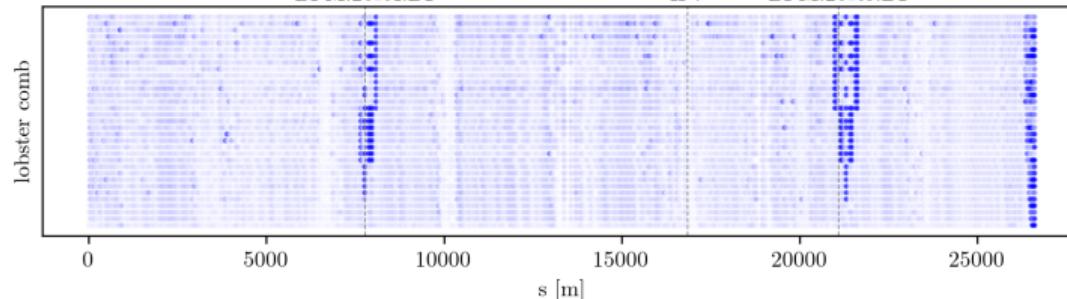
Including Arc Bumps

Model without warm trims – cmin: 1e-06, cmax: 1.0, cgamma: 0.4

BPM.20R4.B1

IP7

BPM.20R8.B1

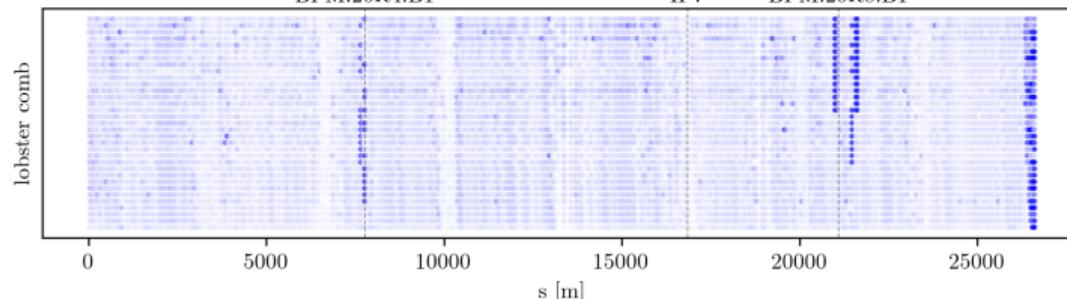


ArcKnob at 0.5 – cmin: 1e-06, cmax: 1.0, cgamma: 0.4

BPM.20R4.B1

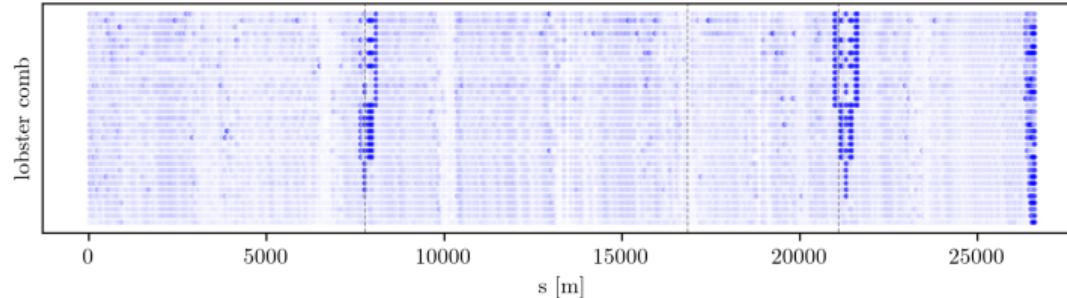
IP7

BPM.20R8.B1

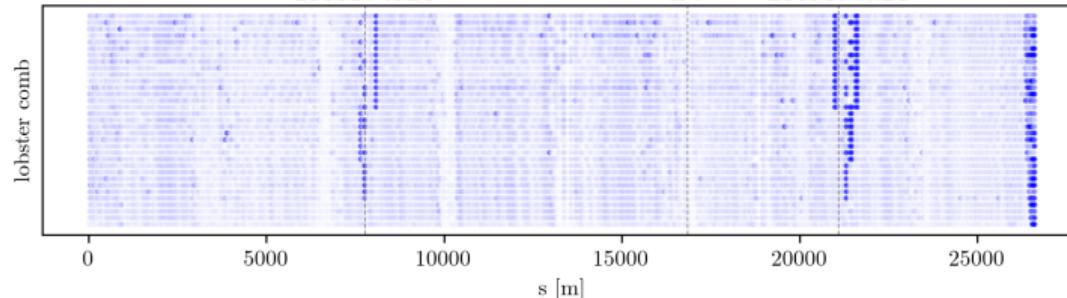


Including Arc Bumps

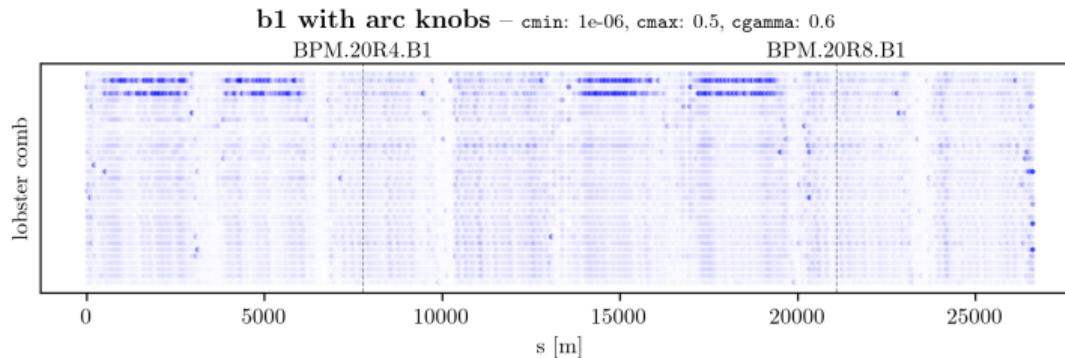
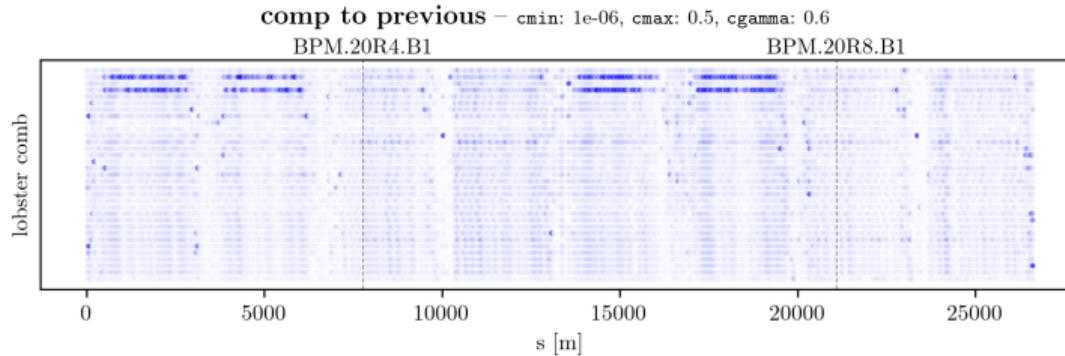
Model without warm trims – cmin: 1e-06, cmax: 1.0, cgamma: 0.4
BPM.20R4.B1 IP7 BPM.20R8.B1



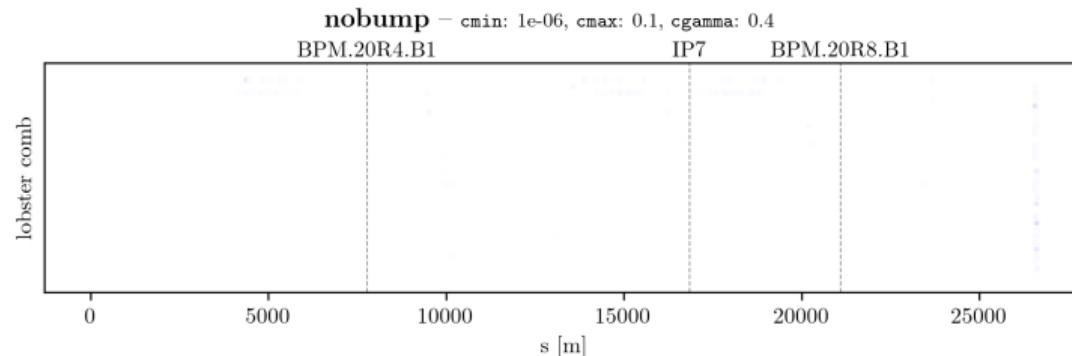
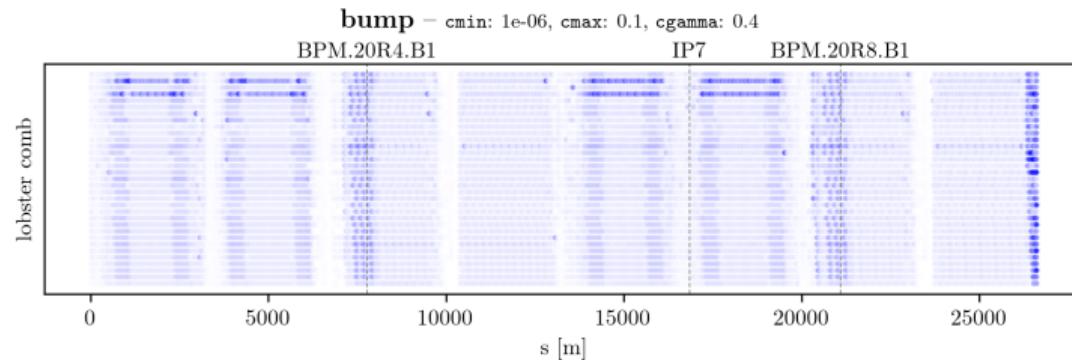
ArcKnob at 0.25 – cmin: 1e-06, cmax: 1.0, cgamma: 0.4
BPM.20R4.B1 IP7 BPM.20R8.B1



Arc Bumps during Commissioning



Simulations – ArcBumps



Simulations – IR7

