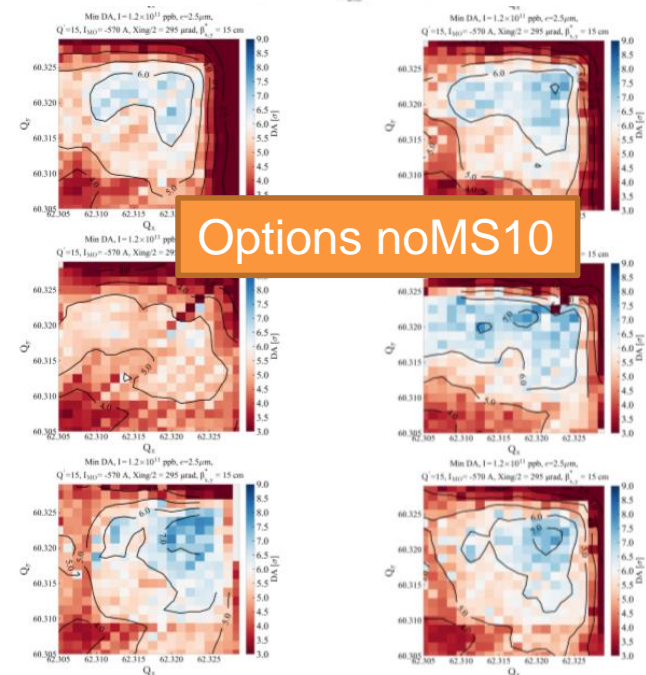
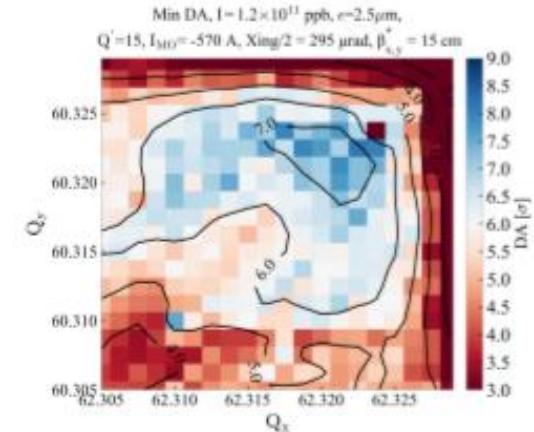


# HL-LHC WP2: Layout and optics

Impact on MS 10 on dynamic aperture and mitigations:

- Complex interplay between sextupole layout, dispersion correction bump, octupole resonance and second order sextupoles resonances.
- Additional MS 10 in the baseline proved to be the most robust options to minimize beta\*, but projects seeks opportunity to simplify LS3 schedule.
- Several successful mitigation strategies studied with compromises:
  - Optimize IP1 – IP5 phase advance reducing optics flexibility
  - Disconnect MS14 and slight compromise off-momentum beta-beating
  - Ad-hoc powering of octupole circuits

Baseline



F. Plassard et al. “Sextupole scheme optimization for HL—LHC”, submitted for approval

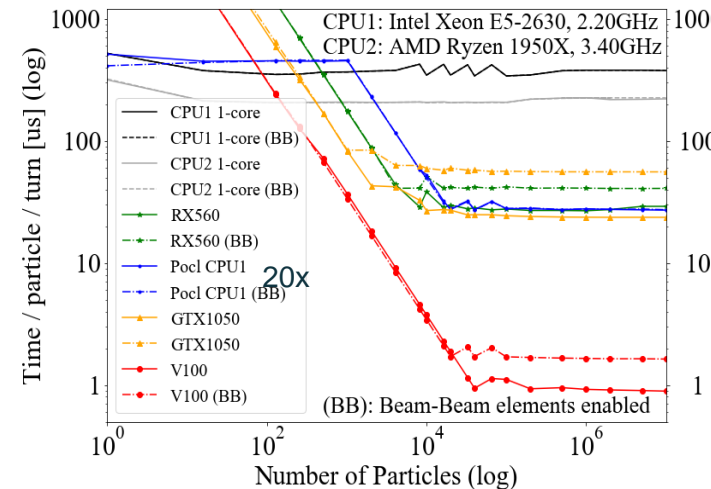
# Tracking: sixtracklib

## SixTrackLib:

- Project born to harvest GPU computing capacity
- Encourage embedding in other codes

## In 2020 (approaching 1.0 release):

- We proved deployment in all GPU and CPU showing excellent scalability
- We haven proven embedding in pyheadtail
- In addition we attracted many collaborators and use cases:
  - LHC, SPS single tracking studies
  - SIS100 tracking studies with pyHeadTail
  - New development of revised 6D beam-beam lens
  - New development of space charge kicks
  - New development of incoherent space charge effects
  - Started collaboration with Nvidia and AMD engineering team and IT procurement



Main work from Martin, Kostas, Gianni, Adrian, Hannes et al.

Many discussions for the next steps are on-going: which level of support, which features to drop or enhance, merging with other the tracking codes