Long-range compensation: PACMAN and HO impact in HL-LHC dynamic aperture

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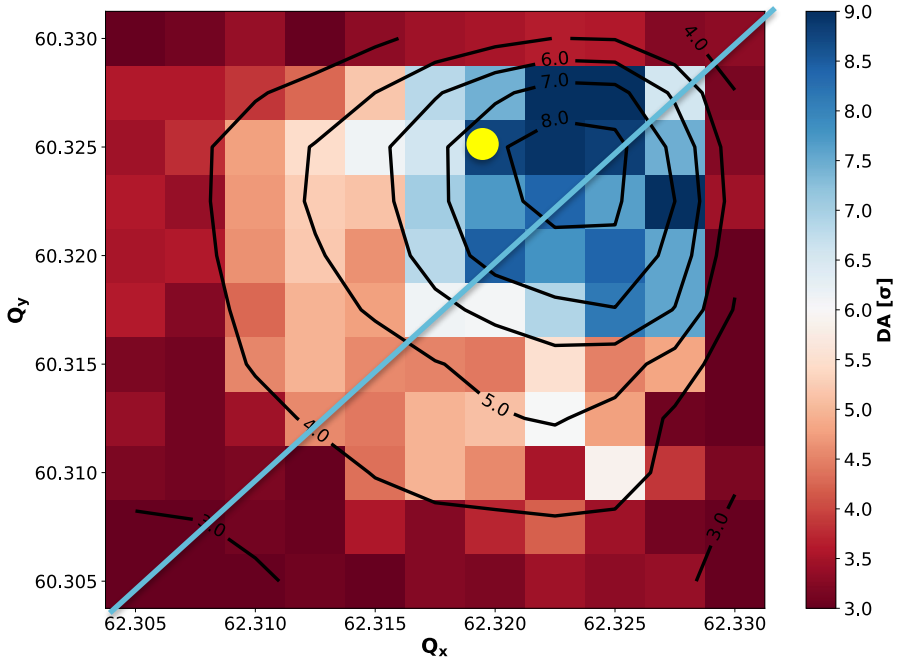
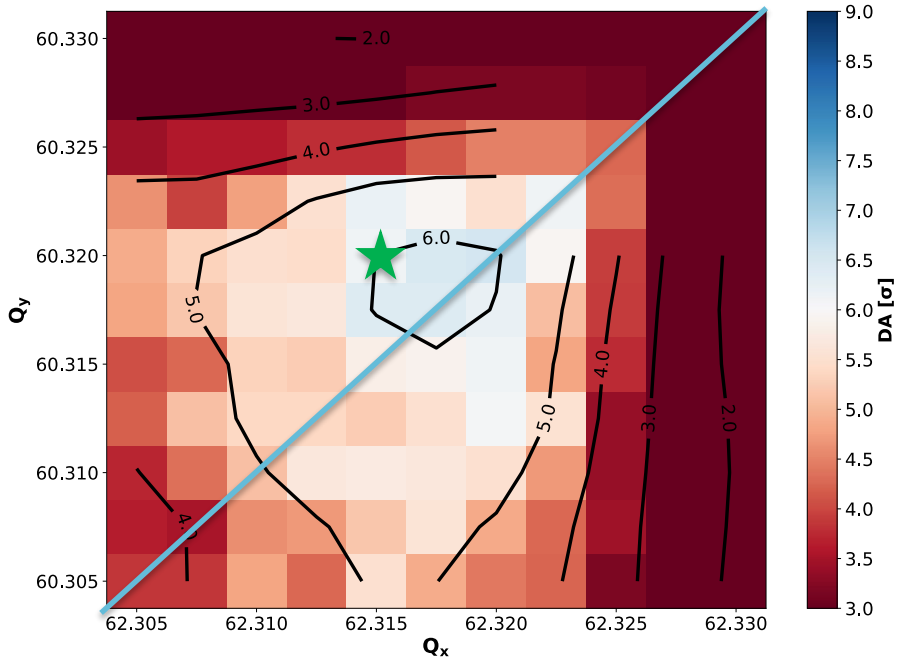
Nominal HO+LR

Updated for the latest optics version (after the bug in generation of optics) to be consistent ➔ No surprises

Min DA HL-LHC v1.3, $I = 2.2\times10^{11}$ ppb, β^*_{IP1}=0.64m
$\phi/2$=250µrad, ε=2.5µm, Q'=15, I_{MO}=-300A

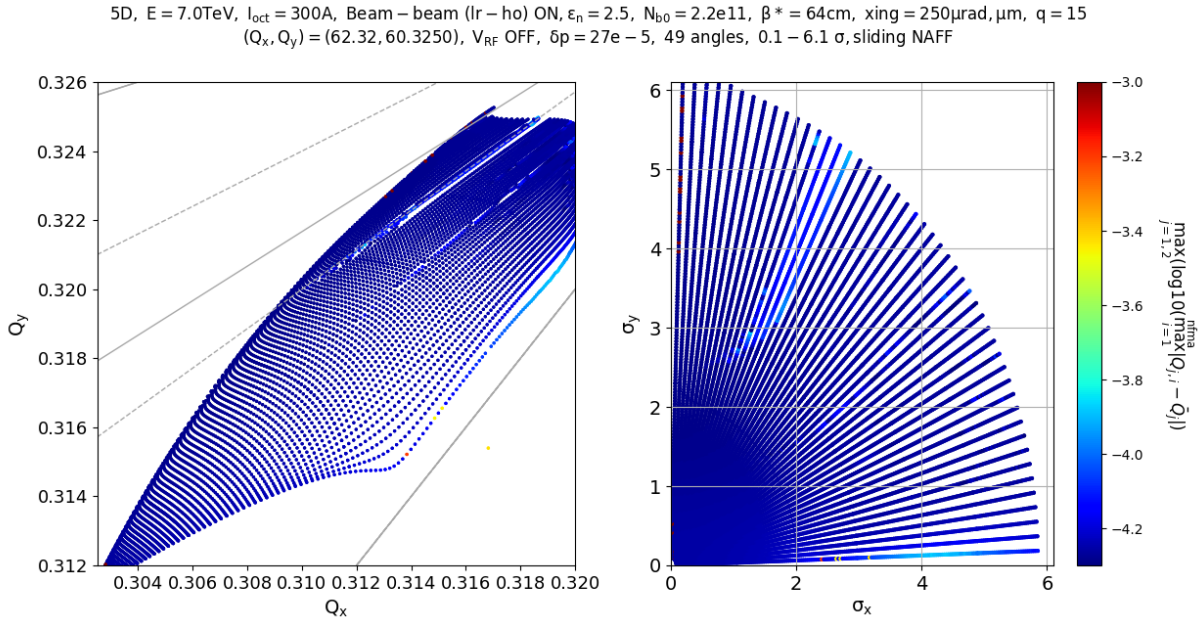


Min DA HL-LHC v1.3, $I = 1.2\times10^{11}$ ppb, β^*_{IP1}=0.15m
$\phi/2$=250µrad, ε=2.5µm, Q'=15, I_{MO}=-300A

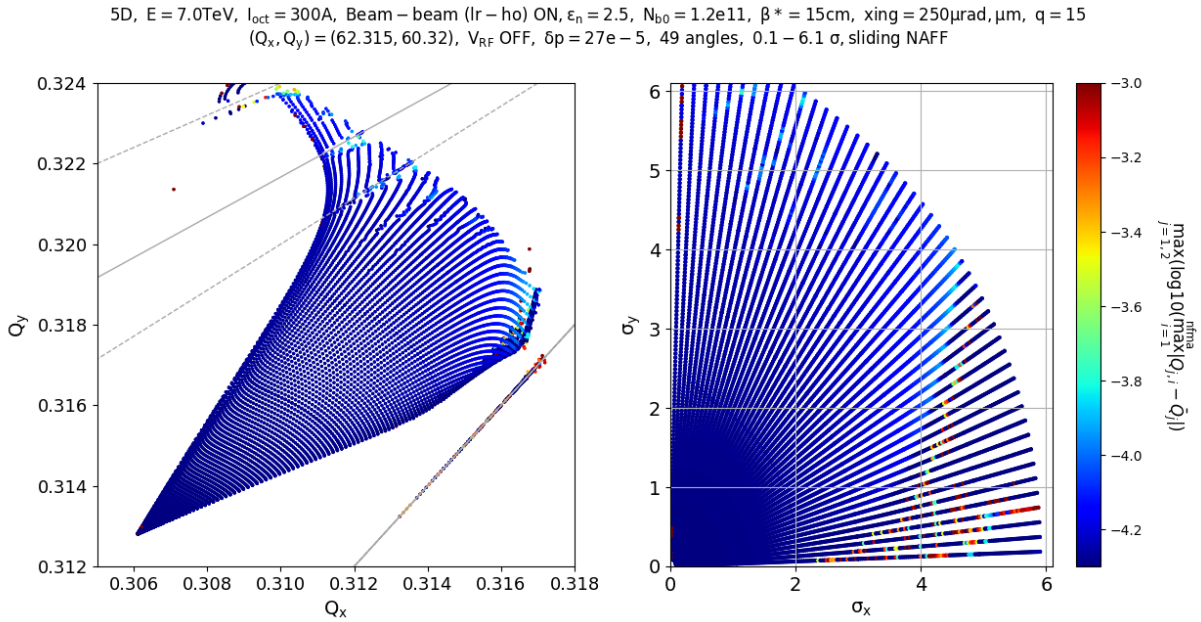


FMA Nominal HO+LR

Nb=2.2e11ppb:

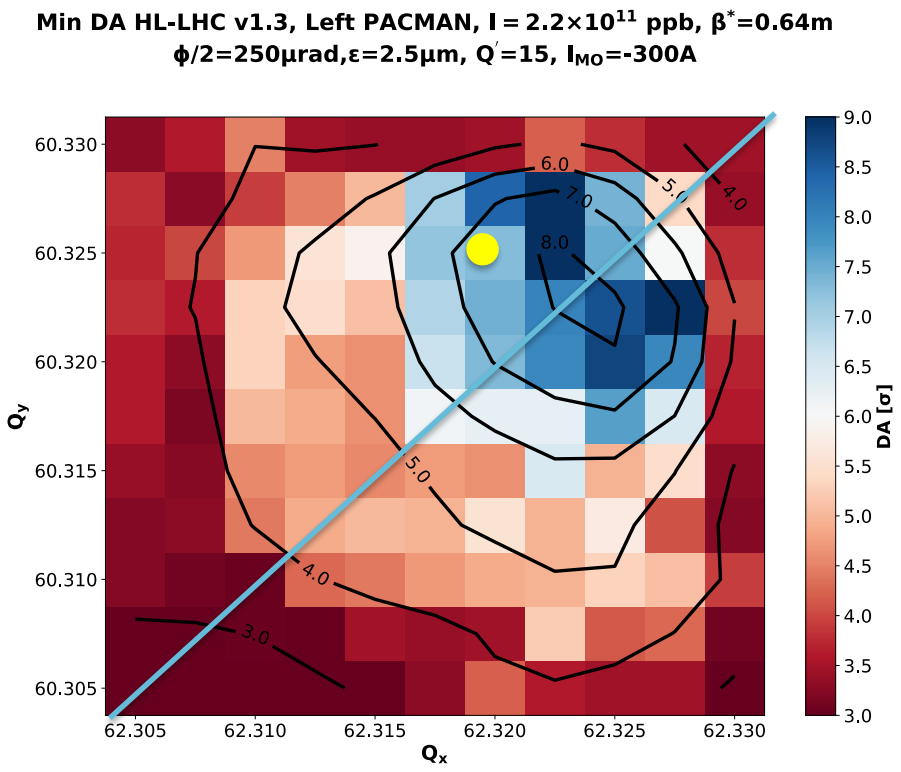


Nb=1.2e11ppb:

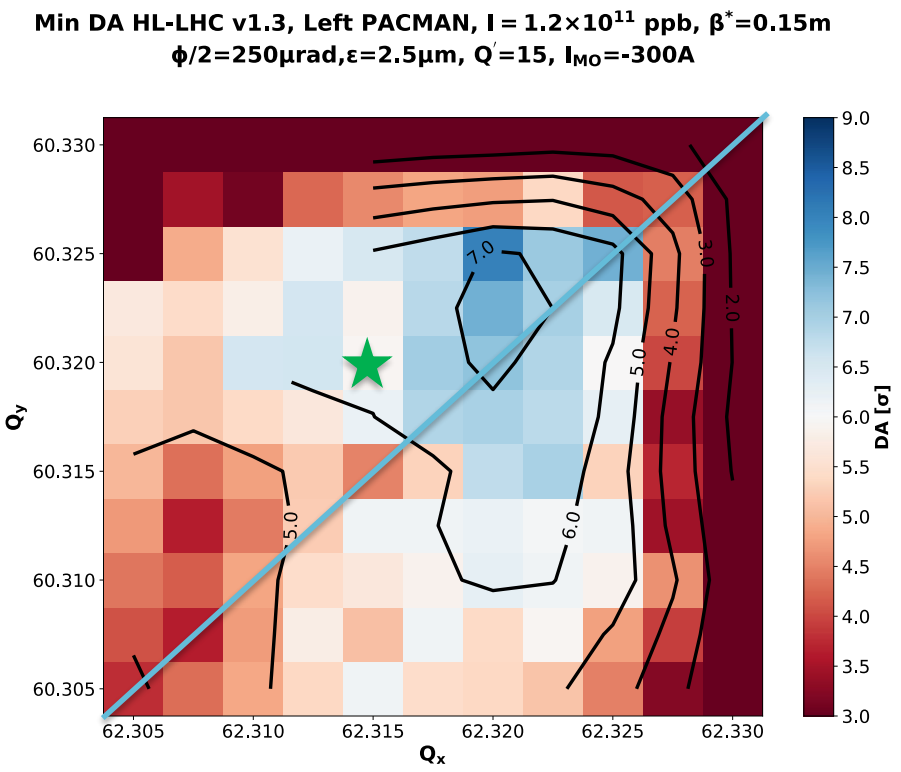


Nominal HO+LEFT PACMAN

(21.8σ d_{bb})

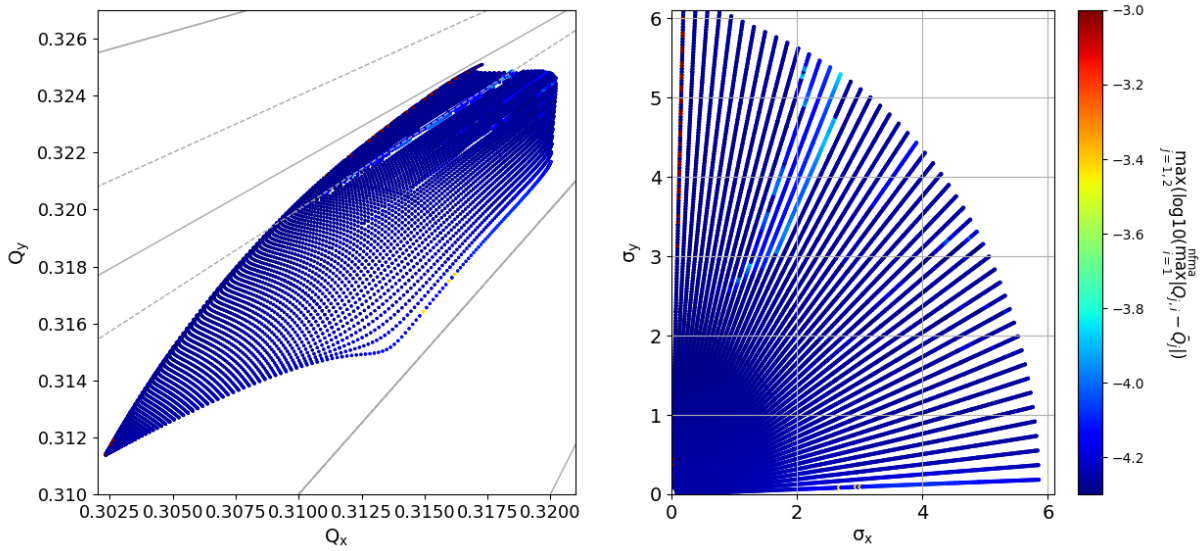


(10.5σ d_{bb})

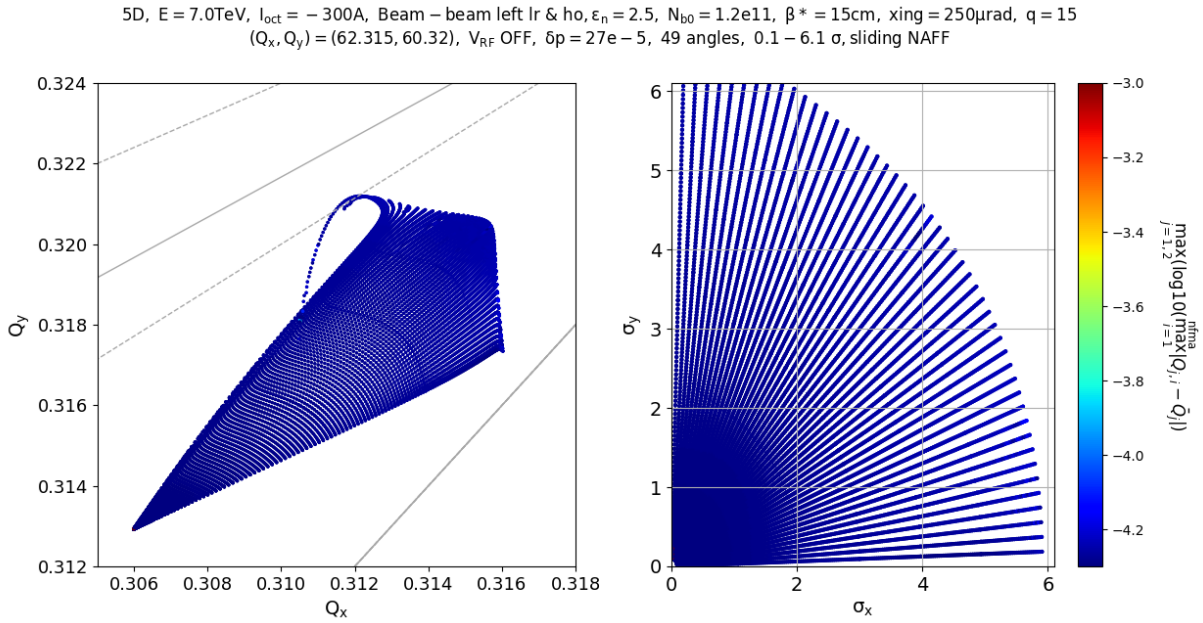


FMA HO+LEFT PACMAN

Nb=2.2e11ppb:

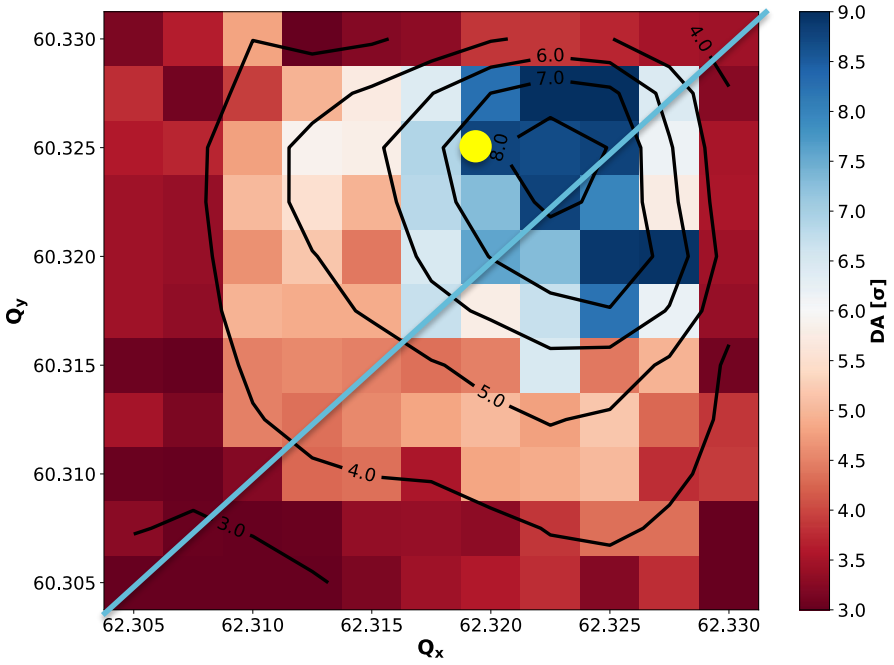


Nb=1.2e11ppb:

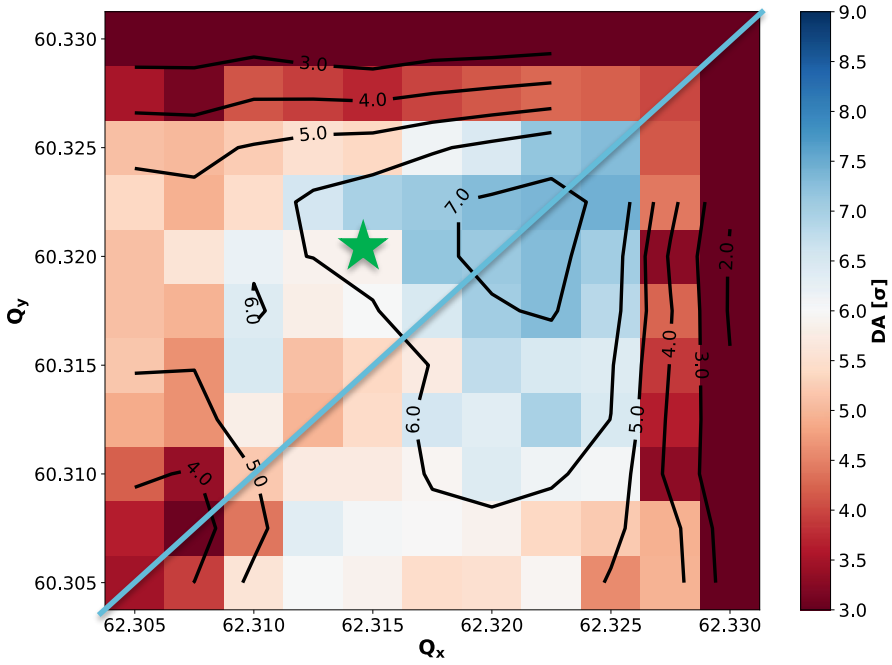


Nominal HO+RIGHT PACMAN

Min DA HL-LHC v1.3, Right PACMAN, $I = 2.2\times10^{11}$ ppb, β^*=0.64m
$\phi/2$=250μrad,ε=2.5μm, Q'=15, I_{MO}=-300A

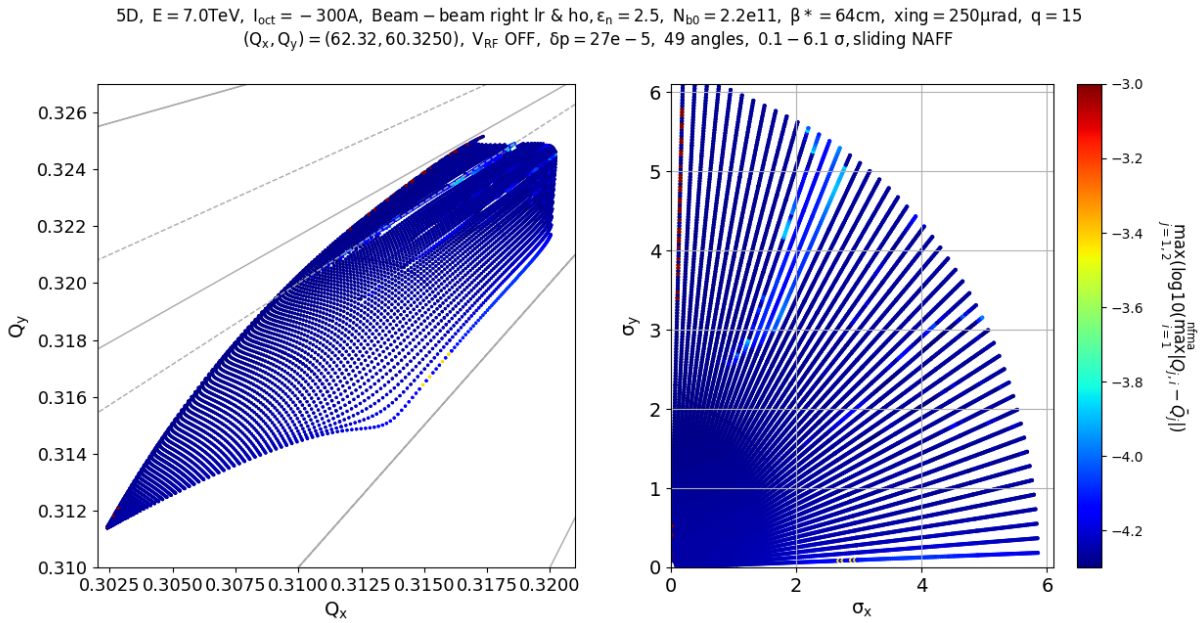


Min DA HL-LHC v1.3, Right PACMAN, $I = 1.2\times10^{11}$ ppb, β^*=0.15m
$\phi/2$=250μrad,ε=2.5μm, Q'=15, I_{MO}=-300A

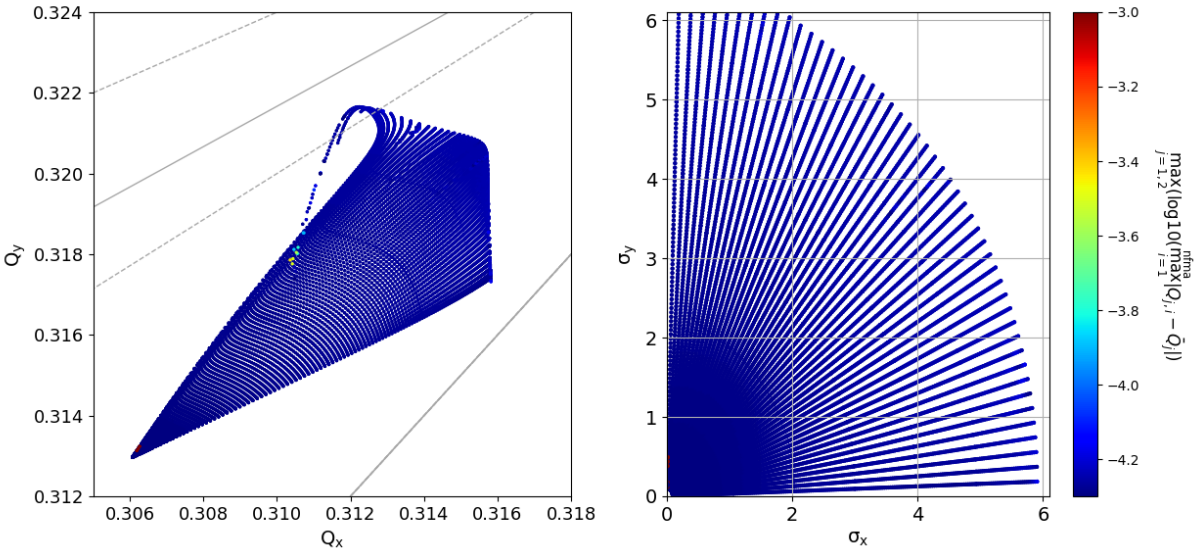


FMA HO+RIGHT PACMAN

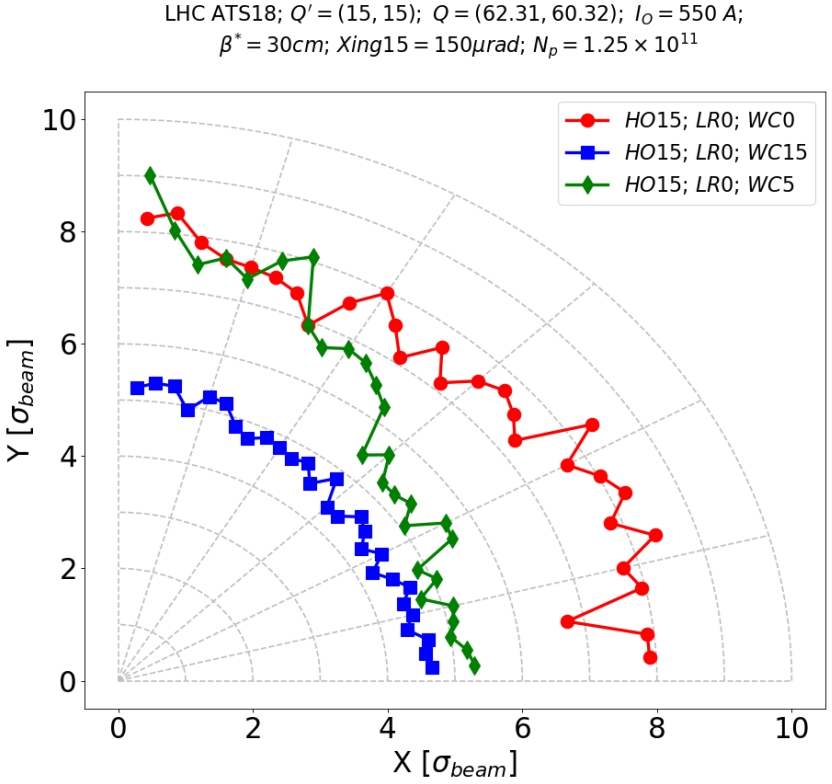
Nb=2.2e11ppb:

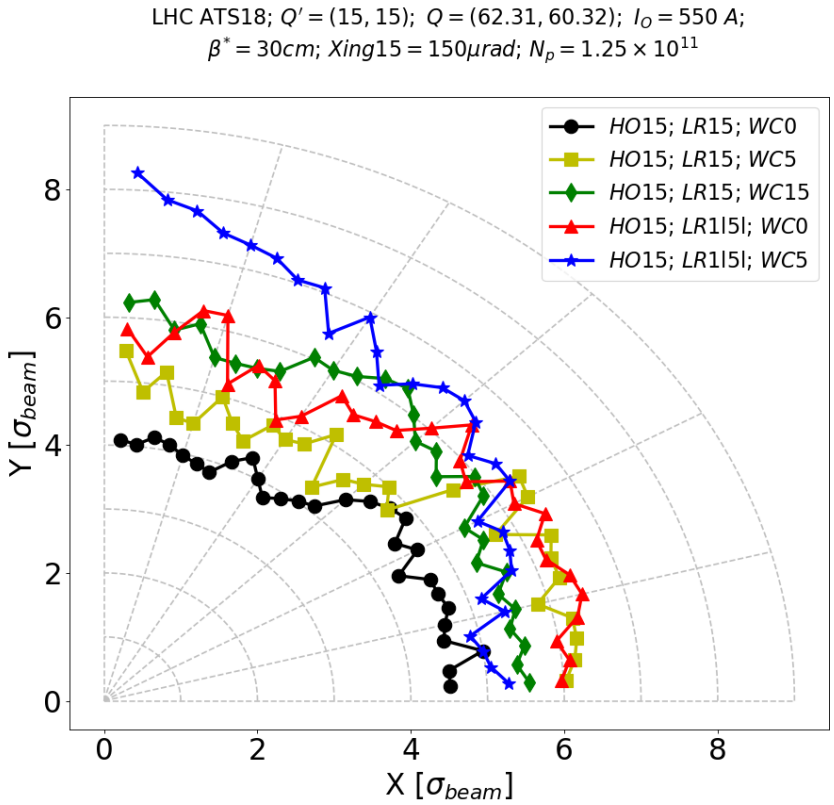


Nb=1.2e11ppb:



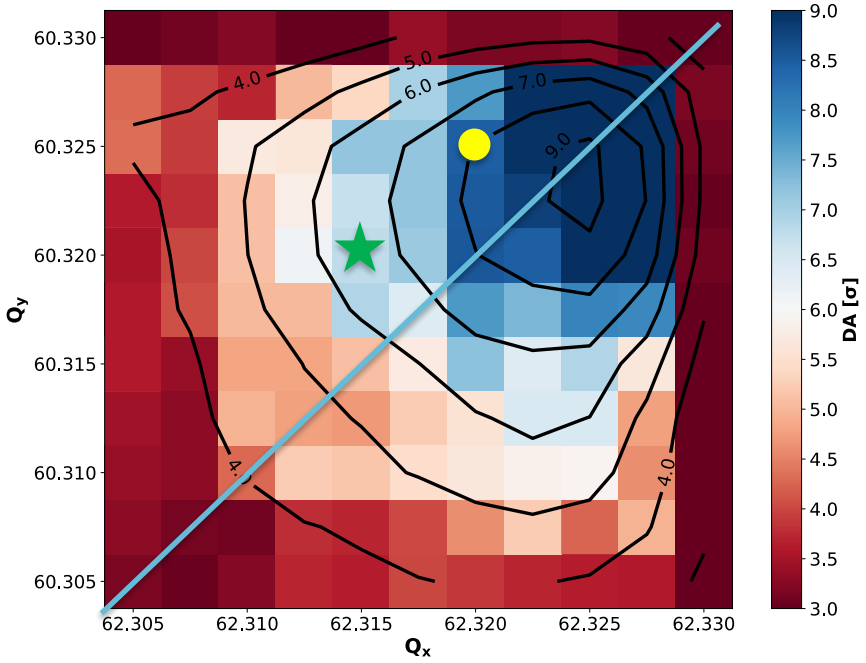
Wire compensation in LHC





Nominal HO+LR | HO Charge = 80%

Min DA HL-LHC v1.3, BBHO Charge 80%, I = 2.2×10^{11} ppb, β_{IP1}=0.64m
ϕ/2=250µrad, ε=2.5µm, Q′=15, I_{MO}=-300A



Min DA HL-LHC v1.3, BBHO Charge 80%, I = 1.2×10^{11} ppb, β_{IP1}=0.15m
ϕ/2=250µrad, ε=2.5µm, Q′=15, I_{MO}=-300A