HL-LHC v1.5. Flat optics. Start of levelling. CC ON. Bunch 1963. $N_b \simeq 2.3 \times 10^{11} ppb$, $\beta_{v, IP1}^* = 0.5 \text{ m}$, $\beta_{x, IP1}^* = 1 \text{ m}$, $\Phi/2_{IP1(H)/5(V)} = 250 \mu rad$ $\sigma_z = 7.61 \text{ cm}, \Phi/2_{\text{IP8, V}} = 170 \text{ }\mu\text{rad}, \ \varepsilon_n = 2.5 \text{ }\mu\text{m}, \ Q' = 15, \ I_{MO} = 410.0 \text{ A}, \ C^- = 0.001$ F. Scheme: 8b4e_1972b_1960_1178_1886_224bpi_12inj 65.302 65.302 65.312 65.312 65.312 65.312 65.35 60.329 -60.327 -- 7.5 - 7.0 60.323 - 2.9- 6.0 60.319 - 2.7 - 5.5 60.315 - 2.8- 4.5 - 4.0 60.313 -60.311 -60.309 -

Vertical tune Q_v

Horizontal tune Q_x