```
HL-LHC v1.6. E = 7.0 \text{ TeV}. N_b \simeq 1.77 \times 10^{11} \text{ ppb},
           L_{1/5} = 5.47 \times 10^{34} \text{cm}^{-2} \text{s}^{-1}, L_2 = 1.93 \times 10^{30} \text{cm}^{-2} \text{s}^{-1}, L_8 = 1.74 \times 10^{33} \text{cm}^{-2} \text{s}^{-1}
                                                                                \beta_{x=1}^* = 0.15 \text{ m}, \beta_{y=1}^* = 0.15 \text{ m}, \text{ polarity IP}_{2/8} = 1/1
         \Phi/2_{1(H)} = 250 \,\mu\text{rad}, \, \Phi/2_{5(V)} = 250 \,\mu\text{rad}, \, \Phi/2_{2V} = -170 \,\mu\text{rad}, \, \Phi/2_{8V} = 170 \,\mu\text{rad}
                                                \sigma_z = 7.61 \text{ cm}, \ \varepsilon_p = 2.3 \ \mu\text{m}, \ Q' = 15, \ I_{MO} = 60.0 \ A, \ C^- = 0.001
                                                      25ns_2452b_2440_1952_2240_248bpi_12inj. Bunch 1130.
                     65.302 65.302 65.312 65.312 65.312 65.310 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 65.35 
- 7.0
60.315 - 4.5 4.5 4.9
                                                                                                                                                                                                                                                                                                                                                                              - 5.0
60.313 -
60.311 -
60.309
```

Horizontal tune Q_x

/ertical tune Q_v