

Abstract

The LHC optics commissioning strategy has developed significantly since the start of Run II. The changes have mainly been driven by the decrease of beta star which was lowered from 80 cm in 2015 down to 25 cm in 2018. This has changed the impact of the nonlinear errors on the beam dynamics which, if left uncorrected, would cause significant reduction in machine performance. As a consequence, the 2015 commissioning was focused on the linear errors while the commissioning in 2017 and 2018 also included the correction of the nonlinear errors. This talk provides an overview of these changes and their impact on machine parameters and performance. It will also review the optics stability and reproducibility. Furthermore, the focus on coupling has increased due to its impact on instabilities and luminosity reduction. The program that was started before the run to develop an automatic coupling tool has been completed and the tool is since 2017 used in operation. The drift of the transverse coupling occurs mainly at injection and a way to mitigate this drift is proposed for the next run.