

Emittance preservation at LHC during the 2012 run

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Abstract

Emittance measurements through the 2012 LHC proton cycle examined possible major sources for the large blow-up through the LHC cycle already seen in 2011. The behavior of single bunch and 50 ns beams from LHC injection to collisions has been investigated. Accuracy and limitations of the LHC transverse profile monitors will be discussed. The effect of 50 Hz noise on the emittance growth and the influence of different transverse damper gains are presented. Intra beam scattering is one of the major sources of blow-up in the horizontal plane at injection. RF batch-by-batch blow-up has been put into operation towards the end of the year to counteract this effect. The impact of these measures on specific luminosity will be presented. The creation of tails through the LHC cycle will also be briefly discussed and an outlook for future LHC upgrade scenarios with low emittance beams will be given.