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First Beam-Beam Long-Range compensation experiment in the CERN Large Hadron Collider

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In a collider such as the Large Hadron Collider or its high luminosity upgrade, the two counter-rotating beams share the same vacuum chamber around the Interaction Point. In this region, they interact electromagnetically either at the the interaction point (Head-On Beam-Beam interactions) or with a longitudinal off with respect to it (Long-range Beam-Beam interactions). The latter spoils the beam lifetime, adding extra losses from parasitic collisions or resonances excitations. One proposed solution for the future high energy colliders like the High-Luminosity LHC is to compensate this effect using DC wires that produce similar kicks as the BBLR interactions. This device is currently consider as an option for the HL-LHC. Prototypes have therefore been built, installed and tested in the LHC in 2017 and 2018 and, for the first time at CERN, a beam-beam compensation was observed. This contribution presents the experimental results obtained in the measurement campaign during the last two years.

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