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Improved antiproton production beam at CERN

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Antiprotons are generated at CERN by extracting a high-intensity proton beam from the Proton Synchrotron (PS) onto a target. The resulting antiprotons are captured in the Antiproton Decelerator (AD) ring. As the AD is about three times shorter than the PS, the entire primary proton beam must be compressed to less than one third of the PS circumference. The previous batch compression brought four bunches injected from the PS Booster (PSB) into consecutive RF buckets at a harmonic number of 20. An improved injection and compression scheme has been developed and commissioned to deliver five bunches to the AD. It became feasible thanks to the upgrades of the injector complex for the High-Luminosity LHC (HL-LHC). One of the four PSB rings delivers twice higher intensity in two bunches, and an optimized sequence of nine different RF harmonics has been set up to obtain five bunches within one quarter of the PS circumference. The contribution summarizes the main changes to the antiproton production beam, as well as the experience of the first year of operation. Results of beam tests with increased total intensity are presented.

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Footnotes

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Yes

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