

Alternative / complementary possibilities

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Generation of higher brightness LHC bunch trains in the PS with RF gymnastics different from the present scheme has been studied. With Linac4 and exploiting the beam of all four PSB rings to fill most of the PS circumference allows bringing the PS close to the direct space charge limit with one injection. Batch compression after acceleration to an appropriate intermediate energy allows increasing the beam brightness at the price of reducing slightly the number of bunches per PS batch. Potential beam characteristics at PS ejection have been estimated, with and without an increase of the PSB to PS transfer energy, and with a single or a double batch injection. The impact of shorter bunch trains on the downstream accelerators has also been analyzed. These new schemes are presented together with their expected benefits. The beam experiments required to reduce the uncertainties and prepare a well-founded upgrade proposal are described.

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