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Crystal assisted extraction of proton beam from the new FCC injector synchrotron installed within the SPS tunnel

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We explore an idea of the use of new superconducting synchrotron placed in the SPS tunnel as the FCC proton injector. The maximum output proton energy will depend on available dipole magnets and can be estimated in the range (1.5 – 3.5) TeV with dipoles from 7 T to 16 T, respectively. The extraction scheme is based on the usage of bent crystal deflectors that could provide beam extraction efficiency up to 90%. We also discuss some modifications of the synchrotron lattice that are necessary for installation of the extraction system elements.

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