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Radiation safety study for the upgrade of LINAC injector for the SOLEIL II low emittance storage ring project.

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The Synchrotron SOLEIL, the French 3rd generation synchrotron light source, will be upgraded to a 4th generation ring, based on multi-bend achromat lattice to achieve a very low emittance electron beam (~80 pm.rad) and a much more brilliant and coherent synchrotron light source.

To achieve this and allow the filling and top-up operation of SOLEIL II new storage ring, the injector, made of a LINAC and a BOOSTER synchrotron must be upgraded too. Regarding Radiation Protection aspect, the upgrade of the LINAC will result by the enhancement of the electron beam energy delivered to the BOOSTER from 110 MeV up to 150 MeV. To comply with the French Nuclear Regulation Authority (so call ASN) requirements, a complete Radiation Safety study of the upgraded LINAC has been done and will be submitted to ASN approval soon.

This paper presents the methodology, measurements and Monte Carlo calculations that have been conducted to assess the radiation fields generated by the upgraded LINAC and to define the potential additional shielding requirements and new beam stoppers. Monte Carlo calculations were performed with the FLUKA particle transport code for both normal beam losses and operation and “reasonably predictable” abnormal beam losses.

Scientific Topic 1

Source terms, new accelerator facilities and related topics

Scientific Topic 2

Scientific Topic 3

Scientific Topic 4

Shielding and dosimetry

Scientific Topic 5

Scientific Topic 6

Scientific Topic 7

Scientific Topic 8

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