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TDR baseline lattice for SOLEIL II upgrade project

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Previous TDR studies for the SOLEIL II Upgrade project have converged towards a lattice alternating 7BA and 4BA HOA type cells providing a low natural horizontal emittance value in the 80 pm.rad range at an energy of 2.75 GeV. This lattice adapts to the current tunnel geometry as well as to preserve as much as possible the present beamline positions. The new TDR lattice is an evolution including perfect straight sections alignment, better relative magnet positioning and more space for accommodating photon absorbers, BPMs and other mandatory diagnostics. The SOLEIL upgrade TDR lattice is then composed of 20 HOA cells with a two-fold symmetry, and provides 20 straight sections having five different lengths of 3.0, 3.6, 4.2, 8.0, and 9 m. This last long straight accommodates a triplet of quadrupoles to set the two low vertical beta functions and an additional canting for the two long beamlines. This paper reports the linear and the non-linear beam dynamic optimizations as well as future directions for performance improvement.

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