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## Update on the lattice design process of BESSY III: towards a baseline lattice

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The lattice design process for BESSY III is based on a systematic & deterministic approach where sub-structures of the MBA lattice are analyzed and optimized before the lattice is composed. During this process, 5 standardized Higher-Order-Multi-Bend-Achromat (HO-6MBA) lattices were developed utilizing different combinations of homogeneous and gradient bends in the unit and the dispersion suppression cell. All lattices yield basically the same emittance, momentum compaction factor, working point, maximal field strengths, and drift lengths. Therefore, they are equivalent to the linear optics. This enables us to attribute any differences in their nonlinear behavior to the specific lattice structure. A detailed description and analysis of the trade-offs of these standardized lattice structures are given. Based on this analysis, the choice of the BESSY III lattice type is motivated.

### Funding Agency

### Footnotes

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Yes

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