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Copper alloy additive manufacturing for SOLEIL II

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The Synchrotron SOLEIL is a large-scale research facility in France that provides synchrotron radiation from terahertz to hard X-rays for various scientific applications. To meet the evolving needs of the scientific community and to remain competitive with other European facilities, SOLEIL has planned an upgrade project called SOLEIL II. The project aims to reconstruct the storage ring as a Diffraction Limited Storage Ring (DLSR) with a record low emittance which will enable nanometric resolution. The mechanical design of this project involves several challenges such as the integration of new magnets, vacuum chambers, insertion devices and beamlines in the existing infrastructure and is mainly based on extensive simulations, prototyping and testing new fabrication methods such as additive manufacturing (AM) to ensure the feasibility, reliability, and performance of several key elements. This paper presents an overview of the mechanical design R&D and thermomechanical performance verifications on copper alloy parts fabricated in additive manufacturing in the scope of SOLEIL-II project.

Footnotes

Funding Agency

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