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Maximizing the SwissFEL performance at hard-X-rays by systematic re-alignment and re-calibration of the aramis undulator line

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The hard X-ray undulator line, Aramis, at the free-electron laser SwissFEL at Paul Scherrer Institute has been in user operation at full beam energy since end of 2018. After continually improving the performance until 2022, we had been struggling to maintain these high-performance levels and dealt with slowly degrading pulse energies and failure to reproduce “good performance”. After a systematic re-alignment and re-calibration of the undulator line and a subsequent optimization of all relevant machine parameters, we have now reached a new record performance of 1 mJ pulse energy at 12 keV photon energy. This contribution will describe the steps taken and lessons learned to achieve this high level of performance.

Footnotes

Paper preparation format

LaTeX

Region represented

Europe

Funding Agency

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