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Physical design for EEHG beamlines of S3FEL

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The proposed Shenzhen Superconducting Soft X-Ray Free-electron Laser (S3FEL) aims at generating FEL pulses between 1nm and 30nm. At phase-I, two undulator beamlines work at EEHG principle. The shortest wavelength is about 2.3nm at a harmonic of 104. However, the various three-dimensional effects of beam can smear out the fine structure in the longitudinal phase space for the EEHG, especially at such high harmonic number. To generate intense full coherent FEL radiation at ultra-short wavelength, a novel technique of EEHG cascaded harmonic lasing method is also considered. Physical design and FEL performance are described in this paper.

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Footnotes

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