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Mechanical system of the double-period undulator prototype for SHINE

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The Shanghai High repetition rate XFEL and Extreme light facility (SHINE) is under construction and aims at generating X-rays between 0.4 and 25 keV with three FEL beamlines at repetition rates of up to 1 MHz. The three undulator lines of the SHINE are referred to as the FEL-I, FEL-II, and FEL-III. Shanghai Advanced Research Institute(SARI) will manufacture 14 double-period undulators with period lengths of 55 mm and 75 mm for FEL-II. Magnetic arrays with different period lengths are mounted on the same aluminum beam, which can generate repulsive forces on the non working side through translation, thereby eliminating the magnetic force on the driving unit. The the working period can be switched by translating the support frame. A double-period undulator prototype has been developed and tested at SARI. This paper describes the mechanical system design, simulation and testing results of the double-period undulator prototype.

Footnotes

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